A BETTER SHARING OF KNOWLEDGE

An open policy for scientific and technical information of the future

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Scientific and Technical Information Department
"A BETTER SHARING OF KNOWLEDGE"
An open policy for scientific and technical information of the future
To move towards a public Science that is open to all its beneficiaries, the CNRS (French National Centre for Scientific Research) has committed to promoting "a better sharing of knowledge" which above all entails improved sharing of scientific and technical information (STI). In our digital technology era, providing the most widespread access to STI is a challenge with paradoxical dimensions. Technologies open promising pathways which are judged irreversible and both France and Europe have opted to move in this direction in general. Daily scientific research demonstrates, however, that many obstacles need to be overcome worldwide. How may this be achieved?

STI is only just entering an era of multiple changes concerning the exploration, representation and sharing of data and results from all scientific communities. The number of new methods or tools available is increasing. The structure and contents of documentation and publications are taking on new forms, requiring in parallel the rules and ethical and legal aspects which frame STI research and its promotion for the benefit of all users to be updated. The growth in the number of publications is universal and the CNRS plays a key role in this by echoing preoccupations common to researchers of all disciplines namely how they should position themselves in the competition between on the one hand the growth in the volume of data and on the other the pertinence of their interpretation and also how to provide "Open Process" services mirroring national and international efforts in favour of Open Access?

These questions, amongst many others, animated the approach that the CNRS Management Board (Collège de Direction) wanted to implement in real terms through this strategy, itself the fruit of a study carried out in collaboration with representatives of all the national STI stake-holders within the CNRS. For these STI professionals and experts, the time has come to provide effective responses to the challenges that the digital era sets for the construction of the STI the science of today and the science of the future require. The strategic task-force initiated by the CNRS Scientific and Technical Information Department (DIST, Direction de l'Information Technique et Scientifique) has thus set objectives involving attaining both short- and medium-term goals. There is a favourable context for this - thanks to the efforts undertaken over the last decade, France now has a promising overall framework for the shared progression of STI which includes the BSN (Digital Scientific Library), Couperin and ABES (Bibliographic Agency for Higher Education).

Taking a step back in the thought process to see more clearly would only make sense if it led to the developments expected by all the researchers' communities and users of research. To achieve this objective, the CNRS General Director appointed for science has launched four Shared Action Plans (Plans d'Actions Partagés, PAPs) aimed at improving the following areas: 1."Obtaining information", 2."Publishing", 3."Analyzing and promoting information", 4."Supporting and promoting STI". The CNRS Institutes will relay this approach, each according to its choice, furthering the work undertaken with the DIST (dist-direction@cnrs-dir.fr) in close collaboration with the INIST (National Institute of Scientific and Technological Information).

The four Action Plans are also more broadly open to the partners of the CNRS. In this way the Alliances, Universities and Research Organizations who so wish can build strong links uniting them with the CNRS in a common effort to pool resources and projects via a shared daily approach to creating an open public Science. In this common effort, where we will all benefit from "a better sharing of knowledge", I hope that the CNRS will once again remain faithful to the national mission that its founding decree assigned to it - notably to contribute "to developing scientific information".

Alain FUCHS,

President of the CNRS
1. AN OVERVIEW OF THE CNRS FIGURES FROM JULY 2013

The French National Centre for Scientific Research (CNRS, Centre national de la recherche scientifique) is a public research organization (public establishment of a scientific and technological nature, placed under the guardianship of the French Ministry of Higher Education and Research (MESR). It produces knowledge and puts this knowledge at the service of society.

With nearly 34,000 staff (of which 25,300 are permanent – 11,300 researchers and 14,000 engineers, technicians and administrative personnel) and a budget of 3.415 milliards of euros for 2013, of which 802 million euros come from its own resources, the CNRS practices its profession in all the areas of knowledge, relying on more than 1100 research and service units.

With 19 Nobel Prize laureates and 11 holders of the Fields medal, CNRS has a long tradition of excellence.

Present in all areas of knowledge

The principal pluridisciplinary research organization in France, the CNRS is present in all major disciplines regrouped into ten Institutes, of which three are national.

- **Institute Of Biological Sciences** (INSB) - Head: Catherine Jessus
- **Institute Of Chemistry** (INC) - Head: Dominique Massiot
- **Institute of Ecology and Environment** (INEE) - Head: Stéphanie Thiébault
- **Institute for Humanities and Social Sciences** (INSHS) - Head: Patrice Bourdelais
- **Institute for Information Sciences and Technologies** (INS21) - Head: Michel Bidoit
- **Institute for Engineering and Systems Sciences** (INSIS) - Head: Jean-Yves Marzin
- **National Institute for Mathematical Sciences** (INSMI) - Head: Christoph Sorger
- **Institute of Physics** (INP) - Head: Jean-François Pinton
- **National Institute of Nuclear and Particle Physics** (IN2P3) - Head: Jacques Martino
- **National Institute for Earth Sciences and Astronomy** (INSU) – Temporary Head: Michel Diament

The CNRS develops in a privileged way collaborations between specialists of different disciplines, particularly with universities, thus opening new fields of investigation that allow the needs of economy and society to be answered.

Open to partnerships

- nearly 94% of the 1100 research and service units are in partnership with Higher education and other organizations of French research;
- 4,521 families of principal patents and 959 permits in portfolios were active at the end of 2012 (first ranked of public institutions for patent depositing in France, behind six major industrial groups);
- 704 innovative companies have been created since 2000;
- 25 executive agreements with the major groups.
- 4,600 foreign researchers received annually into the laboratories, 1,690 permanent foreign researchers in the CNRS and 420 engineers and technicians, 40 cooperation agreements with approximately 30 countries, 293 international programs of scientific cooperation, 158 associated international laboratories and 105 international research groups, 30 international joint research units;
- 600 foreign researchers received annually into laboratories associated with the CNRS;
- 293 international programmes of scientific;
- 158 associated international laboratories;
• 105 international research groups;
• 30 international joint research units active at the end of 2011 of which 7 were created in 2011;
• 26 joint units – French Institutes abroad (UMIFRE);
• 10 permanent representations abroad (Brussels, Hanoï, Malta, Moscow, New Dehli, Peking, Pretoria, Rio de Janeiro, Tokyo, Washington).

The publications

• With an annual average of 29,000 publications, the researchers in laboratories linked to the CNRS contribute approximately 71% of French publications in materials and life sciences – excepting medical research. Over half result from collaborations with at least one foreign laboratory.
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FOREWORD: 10 DIRECTIONS, 4 ACTION PLANS

Scientific and Technical Information (STI) is decisive for the establishment of the competitiveness of French research in the European and international context. By giving coherence to all disciplines and all research partners, the CNRS (French National Centre for Scientific Research) architecture is well-configured to take advantage of the benefits of proximity and placing information on line, which enhance STI at this time of digital technology. These specific assets reinforce the ranking as the first group world-wide that the Organization occupied once more in 2013 by its number of scientific publications. Furthermore, the relative role of the CNRS concerning national scientific publications and their promotion continues to progress.

The STI encompasses equally the conditions wherein researchers have access to the data necessary to carry out their work, including when this data comes directly from the public, along with the conditions by which the results of their research are made available to scientific communities fulfilling all economic and social expectations. In this respect, Scientific and Technical Information is a solid basis for society of the knowledge that France and Europe want to build.

The CNRS has long underlined the potential that numerical tools have to revolutionize the production of scientific and technical information and to favour the dissemination of scientific results. This position was re-affirmed and intensified by the contribution of the CNRS to the National Research Strategy (June 2013). Having available recognized expertise, relying on staff with unanimously accepted skills and being engaged in a strong partnership with stake-holders of higher learning and research, the Organization is in a position, via the Strategic Orientation Plan, to make the best use of the consensus that is taking shape world-wide for Open Access to all benefits of public research for a better sharing of knowledge.

"A better sharing of knowledge", is above all a better distribution of STI and a greater awareness of the current needs of researchers and society.

In this perspective, the STI Orientation Plan of the CNRS, the result of an internal strategic thought process, retained a group of practices, ideas and projects, leading to:

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1 The Decree of November 24th 1982 focusing on the organization and functioning of the CNRS advises (Article 2) that the organization has a national vocation to “develop scientific information”.

2 The DGDS thanks all the participants in the co-construction of the Strategic Orientation Plan of the CNRS IST, particularly the 80 or so people that contributed to the correction phase, along with the final Rereading Commission composed of Mr. Martino, Massiot and Sorger, Institute Directors, Mrs. Michèle Leduc President of the Ethics Committee, Mrs. Marie-Claude Labastie, Chief administrative officer of the National Committee, Mr. Raymond Bérard, Director of the INIST, Mrs. Christine Berthaud, Director of the CCSD, Mr. Jean Daillant, Director of TGIR Soleil, Mr. Bruno David, François-Joseph Ruggiu and Ken Takeda and Mrs. Joanna Janik, STI correspondents of the Institutes.
An assessment: a dynamic of public open science

A vision: powerful STI for "a better sharing of knowledge"

10 Directions for the actions to be constructed with all the partners of the CNRS

4 Shared Action Plans (PAPs)
PART 1:
A CO-CONSTRUCTED THOUGHT PROCESS
I. ASSESSMENT: A DYNAMIC FOR PUBLIC OPEN SCIENCE

Scientific and technical information (STI) is rapidly growing and diversifying, within a scope\(^3\) that comprises “the sum of information produced by research that is necessary for scientific and industrial activity. By its nature, STI covers all scientific and technical sectors and can exist in multiples forms: articles, reviews and scientific books, technical specifications describing synthesis processes, technical documentation that accompanies products, patent notices, bibliographic databases, grey literature, raw databases, open archives and data repositories that are accessible on Internet, portals, etc.”.

As the vector of open science, STI of the digital era is globally confronted by two main challenges:

- To open access conditions,
- To provide a response to all requirements.

To find replies to these two challenges, which serve as the basis of the approach of the STI Strategic Orientation Plan, is to enable “a better sharing of knowledge”. The CNRS intends to be the prime mover in these developments that irrigate all STI research projects.

Now, more than ever, the CNRS is involved in constructing an open public science, which falls within its founding project. Its research missions, to promote and disseminate scientific results, are in phase with the stakes of open access, issues bound closely to those of digital mutations.

OPEN ACCESS APPLIED TO RESEARCH RESULTS

The Berlin Declaration\(^4\) pertaining to Open Access, signed in 2003 by the CNRS and supported by the Institutions, defined Open Access as “a comprehensive source of human knowledge and cultural heritage that has been approved by the scientific community”. This declaration is understood to espouse all research production: “Open Access contributions include original scientific research results, raw data and metadata, source materials, digital representations of pictorial and graphical materials and scholarly multi-media material”.

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\(^3\) MESR (French Ministry of Higher Education and Research), Service for Strategic and Territorial Co-ordination), MISTRD (Mission for Scientific and Technical Information and for Documentary Retrieval)

\(^4\) [http://openaccess.inist.fr/?Declaration-de-Berlin-sur-le-Libre](http://openaccess.inist.fr/?Declaration-de-Berlin-sur-le-Libre)
After a decade of negotiation and practical progress, the year 2013 marked a distinct reinforcement of the consensus along the lines of the basics summarized in 2012 by the CNRS Ethics Committee. At the time of digital technology, STI is also the distribution of initial data and of data resulting from research, accompanied by information (metadata) allowing their re-use, both to validate results and for different aims to the initial ones.

In her declaration of January 24th 2013, Geneviève Fioraso, the Minister for Higher Education and Research, underlined that in the digital era: "Scientific information is a common asset that must be available to all". In this perspective, we expect that Open Access to STI will allow an improvement in research efficiency, notably by furthering interdisciplinarity and visibility and impact of results, for the scientific community itself, but also beyond this for professionals, businessmen, journalists and the interested public. The declarations and positions taken in this sense multiplied during 2013: after Horizon 2020 and its recent application texts and the G8 Science Ministers statement in London in June 2013, new positions were propagated in Great Britain, the USA and Europe.

OPEN ACCESS IN THE DIGITAL ERA

In the contribution of the CNRS to the national Research Strategy (June 1st 2013), the Organization put itself in phase with the issues and approaches of the digital revolution. Notably, the text underlines: "Today, science is undergoing a revolution (amongst others) that leads to a new paradigm according to which science is defined by data. The massive production of data by scientific experiments, sensors, or populations provided with communication equipment (crowdsourcing), is henceforth a classical approach". Furthermore, "knowledge mining, learning, data aggregation and browsing within large masses of data are altogether as many as the instruments that allow phenomena to be observed and discovered, hypotheses to be validated and new models to be elaborated".

1. STI, THE VECTOR OF AN OPEN PUBLIC RESEARCH

Access to Scientific and Technical Information, its circulation and availability are key factors for the efficacy of scientific research.


6Evolution of the position of the British Parliament relative to the Finch rapport, displaying a Green Open Access priority; publication of the application directives of the USA OSTP on the public provision of scientific results; Horizon 2020 approach in Europe; declaration of the AAAS in favour of the adoption of a re-writing of the United Nations Chart concerning sharing the benefits of science...

As at the early time of the diffusion of books, but with an immeasurable vigour, digital STI has created a new dynamic in the sharing of knowledge.

**STI AT THE TIME OF DIGITAL TECHNOLOGY: A NEW DYNAMIC TO SHARE KNOWLEDGE**

E-publishing made the instantaneous growth in the number of readers easier, while allowing a reduced cost of access to STI along with an unprecedented flexibility of exploitation and distribution. Whereas fixed costs are often similar to those of "print" publishing, digital publishing has the unprecedented advantage that variable costs are largely reduced – or in certain cases even suppressed. Serving a large number of customers can be envisaged without risk of exploitation or expenditure, whilst multiplying the services provided to the users and improving the content. This technological characteristic alone is sufficient to explain the multiplication of the methods of sharing knowledge developed in recent years on a global scale, with the creation of "Universal document repositories". 8

**THE ERA OF "DOCUMENT REPOSITORIES AND UNIVERSAL DATA CENTRES"**

In only a few years, production digitalization allowed the establishment of a large number of planetary projects (Web of Science, for example, PLoS, Scopus, PubMedCentral, etc.), along with the tools that permit a global view of a subject, its current pathways of development and discoveries made in related domains. Constantly expanding ranges of analysis metrics are associated with these reservoirs of scientific information9: amongst others, a global stock list takes a census of some hundred analytical tools that match all the main functionalities associated with the research approach (investigation and comparison of ideas, tools of calculation and analysis, tools to explore preferences and opinions, tools to explore data collections, etc.). Through these tools, new approaches are developed to engineer knowledge.

In parallel, disciplinary data centres may be networked with each other and with publications, putting their thematic competences at the service of their communities and at that of the users as a whole, be they scientists or other people: they ensure data quality, validity and their capacity to be retrieved and re-used.

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8 These can henceforth link publications and data with the DOI (digital object identifier) of which INIST is the awarding Agency in France.

NATIONAL STI POLICY AT THE SERVICE OF THE RESEARCHER: A RICH AND STRUCTURED FRAMEWORK

At the end of the numerous thought processes and assessments with which the CNRS has been constantly associated, France was endowed with a national policy of digital STI. Under the authority of the MESR (French Ministry of Higher Education and Research), the Digital Scientific Library or BSN (Bibliothèque Scientifique Numérique) with its 10 current task-forces10 is here to support ongoing developments in the field of Scientific Publishing, integrating their complex features in a global approach. The CNRS, present in all the BSN task-forces thanks to its 24 experts, recently reported its analysis and its observations pertaining to ongoing BSN progress: the CNRS STI Strategic Orientation Plan depends on its resources and its projects, notably thanks to the INIST.

The Bibliographic Agency for Higher Education or ABES (Agence Bibliographique de l'Enseignement supérieur), is a public purchaser and an expert of the highest quality, a partner of all users of the ESR.

The Couperin Consortium offers a comprehensive strategic framework for a global approach of negotiation and recommendations to the scientific community (universities and research organizations) when contacting its partners and supporters.

The Centre for Direct Scientific Communication or CCSD (Centre de Communication Scientifique Technique Directe), as the national operator, offers Open Access solutions for all researchers and academics, via its services centred on the submission and diffusion of publications in HAL (Online Hyper Articles).

The PERSEE UMS (Joint Service Unit) has the goal of being a national operator for the provision of retrospective French scientific production to the service of actively operating science (thus enlarging the PERSEE programme supported by the MESR, which was initially principally in the Directorate of Humanities and Social Sciences, themselves the subject of a specific investment by the TGIR (very large scale infrastructure) Huma-Num).

Pioneering initiatives led to the development of coherent STI policies at the scale of public research organizations: assembled in the EPRIST Association, research organizations exchange their experiences. Several large national public establishments thus share the advances to which each is the most committed11.

The CNRS (DIST, Scientific and Technological Information Department) is the pilot of the ISTEX Excellence Initiative for Scientific and Technical Information, which aims to offer the whole community of higher education and research "on-line access to retrospective collections of scientific literature from all disciplines". This project falls within the "Invest-
ments for the Future" programme initiated by the MESR; the direct ambition of ISTEX is to "reinforce French research and higher education on the world-wide stage". ISTEX will also allow the promotion of the national licence acquisition policy, by rendering clearly accessible the current collections and archives.

2. CHALLENGE 1: OPENING THE ACCESS CONDITIONS TO STI

At the time of digital technology, legal and economic STI models are put to a severe test: the rules of publishing, financing and STI diffusion have given way to uncertainties. The global need for clarification is obvious. The free service of public research benefits will depend on this clarification.

THE RIGHTS OF PUBLISHING AND PUBLIC DISSEMINATION OF STI

Research workers and supervisory staff, the users of STI in digital format, have expressed a need for clarification of the regulations, or rules and laws, which are applicable to the publication activity and associated services, notably in all cases where public rights border private ones, the latter being better defined and defended at the current time. Like other domains of digital law, the rights of public scientific publishing, with respect to the freedom to undertake it, require an evolution of rules and practices. Furthermore, the Prime Minister encouraged a regulatory action entrusted to COEPIA (the Board of Direction of Public Publishing and Administrative Information). The questions asked are notably those of the rights of the author, rights assignment, Creative Commons permits, etc. The need to secure the diffusion of STI in the public sphere is also increasing with respect to multiple aspects of the right to exploit digital archives. The CNRS takes its share in the progress made in the digital dissemination of knowledge, particularly in operating this Investment for the Future major ISTEX project. This is dedicated to making an unprecedented mass of scientific digital archive resources available to academia and research and was previously legally accredited to ensure and strengthen its core infrastructure function under public law and in relation to knowledge distribution for the common good.

12 In this sense, BSN7 (College of Scientific Digital Publishing) diffused in 2013 a "Charter of good practices for scientific digital publishing".
"Databases" are an integral part of STI. However, the multiplication in the number of databases and of sharing and publishing research data has created new needs. In the face of this, secure solutions sometimes default. A growing spectrum of scientific communities (notably environmental sciences, biology and SHS, but also chemistry, etc.) is thus pondering the ethical (respect of privacy, rights of sharing, intellectual ownership, etc.) and legal conditions (responsibility, moral code, safety, property rights, legal protection of individual and collective freedom, commercial rights, penal rights, etc.) that should be taken into account to enable the storage, handling, re-utilisation and sharing of STI materials that are research data. These clarifications, applicable to series of data, are the conditions that confront the need to share the benefits of science. In France, ETALAB is now one of the development partners and the potential recipient of a part of STI material. This national and European policy is the object of texts that are applicable in 2014.

The movement towards Open Access has been overtaken by a general discussion on the sharing of merit in the editorial chain, on the profit margins associated with the activity of the global co-operations and on the optimal business models of publication. The heterogeneity of forms of publishing, along with the variety of the relationships that the publication communities enjoy with scientific publishing bodies, currently prevents the development of a single solution based on the principle of Open Access to STI.

With a whole panoply of intermediate combinations, three approaches are known to dictate STI dissemination: the “author-pays” model journals (the so-called author being one of: the producer of the resource, his laboratory, or his institute, or any other assignee), or the “reader-pays” model journals (the reader himself, or any other user of an on line resource bought by an Institution, such as a library for example). Finally, Open Access journals also develop several business models (for example, Open Edition's Freemium model).

A large-scale comparative study of costs recently published in Nature distinguishes mainstream publications associated with the principal scientific publishers from those that fall within the jurisdiction of Open Access, with costs that vary from the single to more than double. Nevertheless, the differences between the "models" must take into account

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13 Because of its growth, the definition of research data can now include ambiguities.

14 Hence the discussion concerning the price of APC (Article-Processing Charges) that the publishers demand as compensation for their exploitation costs.

15 Nature: “The true cost of science publishing. Cheap open access journals raise questions about the value publishers add for their money” Vol 495 28 March 2013, p.426
the services to the researcher present in each model; to date studies generally lack in service content of the models, a subject which the French Academy of Sciences is currently redressing by a global assessment. This preliminary and necessary reflection explains how the European Commission took a stand on Open Access, without making a decision for the moment as to the existing models.

3. CHALLENGE 2: OFFERING A COHERENT ANSWER TO ALL NEEDS

The needs of STI, distinguished from one scientific community to another, are (with some exceptions) strongly increasing and promise to intensify further. "Knowledge engineering" approaches are appearing and bringing new pathways and modes of scientific publication.

PUBLISHING PRACTICES ARE DIFFERENTIATED ACCORDING TO THE RESEARCH COMMUNITY

Whilst in principle globally supporting the aim of open public science, scientific communities maintain variable links with scientific publishing: in biology, for example, it is common to observe simultaneously an approach using the large Open Access repositories, such as PubMedCentral, and a strong relationship with the major international publishers (as mentioned above). Practices in the field of physics accord a major, and growing, share to the large preprint Open Access repositories, principally arXiv, which makes peer evaluation of the journal evolve. Astronomers maintain close links with their most important publications, which are few in number and run by the representative bodies of the community (learned societies, ESO), while being users of arXiv. The community of mathematics is a major user of arXiv and HAL, but also relies on a range of often much older learned journals which are still in print format. This last type of publication is also used by many SHS communities, which are equally very open to and drive digital applications of STI. Certain reviews of these two communities work using an economic model of which the viability is based on the concept of the moving wall. The projected development of STI options must take into account these different pathways to publication access, harness their systematic dynamics and anticipate all possible consequences, notably those concerning budgets.
SCIENTIFIC PUBLICATIONS: A CONTINUAL AND STRONG INCREASE

The annual growth of global scientific production is spectacular: in world-wide terms, according to Scimago data (http://www.scimagojr.com/), the yearly production of scientific publications increased between 1996 and 2012 from 1,134,000 to 2,250,000 articles per year on the Scopus database, i.e. without counting the healthy contribution of humanities and social sciences. The increase has gained momentum notably since 2004, with the contribution of emerging countries to the flow of publications. Part of this expansion is due to a rise in scientific activity on a world-wide scale. Another proportion rather reflects the increasing pressure to publish more and more articles due to the growing importance of bibliometrics, which is amplified by the interests of commercial publishers. This component of the rise in publishing is therefore not necessarily a sign of healthy science according to the INSMI (National Institute for Mathematical Sciences).

DATA AND PUBLICATIONS: A RACE

The scientific activity of the 21st century depends on a new dimension of investigation, a new paradigm: with the development of methods of research (sensors, probes, sequencers, instruments of observation), the mass of data generated is large and extends beyond the challenge of their analysis and treatment. Thus, the question of data organization, storage and access has become a major preoccupation. Despite its rapid growth, the publication effort has increased in proportion to research data production. Taking as a base the global population of two million people currently publishing, an order of magnitude16 was given to the final destination of observational data produced by research. Two percent of data are dispatched to specialized numerical repositories (PetDB, PDB, SedDB, MiRB, TAIR, etc.), while 8% of scientific data are destined for the large generalized databases (DataVerse, Dryad, institutional storage). Thus, 10% of research data are used by scientific publications and 90% remain stored on local hard disks. Certain pioneering disciplines have set up a policy of "open" data: in astronomy for example, the data captured by ground and space telescopes are made available to everybody after a period of "ownership" under the responsibility of the agencies in charge of the instruments (generally one year).

16 A recent evaluation, amongst others, offers an image of the total volume of observations produced by the annual global scientific research. A. de Waard: “Epistemic Modality and Knowledge Attribution: Types and features” Elsevier Labs, Universiteit Utrecht, July 2012
TOWARDS "KNOWLEDGE ENGINEERING"

With the boom in international co-operations, specialization to interdisciplinarity, financing of projects, with the massive help of large equipment and shared means of calculations, research practices have evolved considerably in recent decades. It is now over ten years since the concept of e-science was forged (enhanced science, John Taylor, 1999), making reference to this new collaborative and allocated science, built on the access to large reservoirs of data, high-speed broadband and means of calculation, as well as high-performance visualization equipment. All those involved in science (funders, governments, research organizations, learned societies, publishers, research operators and industrialists) have a vocation to contribute to the development of "Science as an open enterprise", as is analyzed in the recent report of the Royal Society (2012). This report stresses the need to cope with the outpouring of data using modern technologies to fulfil their extraordinary potential, for the benefit of science and society.

The efficiency of science depends today on its capacity to treat and exploit the mass of data produced in different environments. Its efficacy in years to come will be measured by its ability to handle, share and enable the re-utilization of these same data.

The "raw databases", an integral part of STI in the ministerial definition, are thus used in the approaches that together influence the activity and architecture of publication. These approaches are unequally integrated amongst themselves.

Making these choices co-exist coherently does not seem incongruous in the guiding CNRS STI Schema aimed at defining and implementing an understandable approach to "knowledge engineering" that is currently beginning to be detectable. The generic questions that are raised in a transversal fashion across disciplines concern the norms and description standards for data (metadata), rules of sharing, secure access, perennial storage and archiving, in addition to the legal and ethical aspects discussed above.

There are thus so many stimulating subjects for this “knowledge engineering” that the tools also develop rapidly on an extremely wide scale based on text and data mining, ontologies, semantic web treatment. The target could be to supply researchers and users with an integrated support service for the construction of digital publications.

The CNRS employees that support research are as close as possible to researchers in their laboratories, or in service structures and already participate in the development and maintenance of data infrastructures, all the while developing approaches that aim to re-unite the functionalities described above (notably INSHS, INSU).

17 See for example: "Comparison of Research Networking Tools and Research Profiling Systems"
II. A VISION : A STRONG STI FOR "A BETTER SHARING OF KNOWLEDGE"

With convincing results concerning its organization, the CNRS confirms its driving action concerning STI in the digital era. This exploit relies on a national STI policy, which supplies a favourable upstream framework. Now is thus the time to share resources and projects with the research teams of Universities and Organizations: the Strategic Orientation Plan supplies a frame to build together the STI Action Plans.

1. THE CNRS, STRENGTH OF PROPOSAL

CONVINCING PUBLICATION RESULTS IN THE ERA OF DIGITAL TECHNOLOGY

It is known that the Organization architecture consists of a double articulation: that of the different disciplines and that of all its research partners. The CNRS thus benefits from a close proximity of resources and projects in nearly all the main research domains and so can optimize the network effects required by Open Science. The double articulation is associated with less well-known results that belie the analysis according to which a strong fundamental research policy would be opposed to upstream-downstream sharing. The CNRS filed over 400 patents in 2012 and is thus placed 5th nationally.18

In this era of digital technology, these assets of double articulation can serve in the understanding of the CNRS’ favourable position in the field of global scientific publication. As in 2012 the CNRS was well-classed in 2013, being ranked 1st of Scientific Institutions world-wide in terms of research documents published and indexed in the international databases (SIR, Scimago Institutions Rankings), with a level of 58% of international co-publications.

Moreover, this global position is dynamic. In the 2013 SIR ranking, the criteria of publication quality associated with the CNRS’ position are progressing in the main. Other specialized world-wide ratings corroborate this first impression. For example, the 2012 Nature Publishing Index places the CNRS 5th world-wide of Research Institutions whose results are published by Journals of the Nature group, this position being on the rise (the CNRS was ranked 7th in 2011).

18 See the ranking list of the principal patent applicants published in 2012 – INPI key figures of 2012 [link]
A DRIVING ROLE IN SHARING AND DEVELOPMENT OF KNOWLEDGE

Furthermore, the CNRS is making distinct progress in the relative part of publications produced by research units linked to the CNRS. The CNRS is a dominating and dynamic force which drives the production of national scientific publications. The diagram shown below gives an insight into this: the portion of laboratories associated with the CNRS is always at least equal to 50% and often above 70%, depending on the discipline, continually growing in recent years, which procures a global measure of the “performance” mobilized by the Organization.

Contribution of laboratories linked to the CNRS to the French production of scientific laboratories

Portion of publications from laboratories linked to the CNRS and their impact in French scientific production by scientific fields (2010-2012)

Source: Thomson Reuters Data. Treated by CNRS / SAPPs, 2013

When all disciplines were considered (except for medical research), the share of publications in French scientific production from laboratories linked to the CNRS reached 70.9%
in 2011\textsuperscript{19}. This result has been in constant progress in recent years. By the collaborations to which they attest, these data place the Organization as the prime mover for the development of STI support actions, of which the CNRS was often the forerunner.

**A PIONEERING ROLE IN TERMS OF STI**

The CNRS’ action within the subject is ancient and diversified, even if it lacked visibility. In fact, the audit of the CNRS by AERES noted in 2012\textsuperscript{20}: “a federating effect of initiatives and energies is to be expected from the participation of the CNRS in the numerical scientific library national project (BSN), but almost all remains to be accomplished to ensure that the CNRS uses for the better the enormity of the data and knowledge available within its corpus”. However, as already indicated, it was indeed by the CNRS that the first institutional positions were taken in favour of Open Access. Other major achievements, sometimes quite anterior to Open Access, are worthy of mention, such as the Centre of Astronomical Data in Strasbourg (CDS-INSU), which in 2012 celebrated 40 years of existence, the French National Chemical Library, the support to databases given by the creation of the BBEES unit at INEE, the white book of intensive calculations and, more recently, the Mastodons initiative supported by the CNRS Mission for Interdisciplinarity with notably the PREDON project.

For its part, the InSHS employs TGIR Huma-Num and Progedo to bring a structuring reflection process at the scale of the entire Institute, i.e. without restrictions concerning sub-disciplines. The stakes of Huma-Num are clearly to build an infrastructure for digital humanities, going even beyond the management of data to take into account also the means of analysis and the treatment of these data, while Progedo ensures the management of quantitative data. Furthermore, CLEO is an extremely innovative research unit in the subject of Open Access electronic publishing, with over 350 Human Science Journals, 700 academic blogs and a platform dedicated to book collections, which was inaugurated in February 2013.

Starting from an enquiry pertaining to databases that existed in laboratories in 2010, the INEE became aware of the need to intervene urgently to avoid the loss of a part of these; hence the creation of the BBEES UMS (*Joint Service Unit*) which aims to bring support and method to the management of biodiversity research databases.

\textsuperscript{19} Contribution of the CNRS to the national research strategy, 1\textsuperscript{st} June 2013, p.6: “The strategic role of HSS in the interconnection challenges to society ensures fragmentation and redundancy are avoided, allows networking by the search for the basis of questions of society for which an interdisciplinary mobilization is necessary (etc.)”

\textsuperscript{20} AERES Audit of the CNRS, 2012, Note 61
Each Institute can thus cite a sub-discipline that led a reflection on the subject of information, because certain communities, who often share heavy equipment that produce the data, follow standards and have defined common practices (astrophysicists, seismologists, geochemists, molecular biologists, etc.). For their part, mathematicians are concerned by the availability of their erstwhile output, pertinent to this discipline, via NUM-DAM.

**RISKS TO OVERCOME**

Faced with its assets, the CNRS has as a challenge to strongly confront the need to renew knowledge and staff qualifications. The networks of STI personnel are ready to act in this sense and are prepared to do so. Additionally, there is a large margin of progression to fulfil by a better articulation between STI employees and researchers, in the communities where this relationship has not yet been able to put itself in phase. Also, work remains concerning making researchers aware of the utility of sharing their data. Equally, among the hazards exists that of the uncontrolled accumulation of new concepts, where these are deployed without being placed in common and without audit. The extremely rapid development of new approaches appears to require cohesiveness and a sharing of the results.

### 2. SHARING OF RESOURCES AND PROJECTS

**AN INTERNAL STRATEGICAL REFLECTION**

To place STI concerns in context, as was proposed by the national mission on the subject\(^\text{21}\), the CNRS undertook to take stock of the (often long-standing) knowledge, analyses and resources present in the Organization. The DGDS (*Chief Scientific Officer*) entrusted this assignment to the DIST (*Scientific and Technical Information Department*). The DIST was to produce an inventory report and then assist in the establishment of a strategy for the CNRS, to be defined in relation with all the communities involved in STI actions.

At the end of this operation, the result of a co-constructed thought process\(^\text{22}\) with the STI communities in the organization\(^\text{23}\), a task-force of approximately 80 experts and decision-

\(^{21}\) The decree of November 24\textsuperscript{th} 1982 concerning the Organization and the functioning of the CNRS states (Article 2) that the Organization has as a vocation, amongst its national duties, to “develop scientific information”.

\(^{22}\) The DIST thanks all the direct contributors to this approach and the members of the composition Committee of the final document (……)

\(^{23}\) The ten CNRS Institutes, along with several of their internal STI components (Cléo, MathDoc etc.), the networks of STI employees (RBDD, Medici, Renatis), specialized Units of STI (INIST, CCSD, Persée), the Ethics Committee and the General Secretariat of the National Committee. The DIST also collected the contributions of two TGIR (Huma-Num and Soleil). Two departments of the head office
makers belonging to the CNRS scientific communities, the Management Board of the CNRS had retained the choices of the current Strategic Orientation Plan.

A CO-CONSTRUCTED ACTION PLAN WITH THE UNIVERSITIES AND ORGANIZATIONS

Starting in December 2013, with the impetus of the DGDS, this strategic internal reflection led to an STI Action Plan that the CNRS proposed to its partners (Universities, Research Organizations, Alliances, OST)\textsuperscript{24}. The aim was a co-construction, invoking all the leverage effects of the partnerships, to better share STI. This plan will also be available according to the contractual calendars of the CNRS and its partners (2014-2017 Contract with the MESR, Site Agreements). The Action Plan will lie downstream of the resources and ongoing work of the BSN task-forces and will thus contribute to the distribution of the operational action gains.

The CNRS thus submits its ten action principles, which follow, for discussion and for the preparation of common choices with its partners.

\textsuperscript{24}The CNRS counts 845 UMR amongst its 1053 research units.
## III. TEN DIRECTIONS FOR STI ACTION

The practices and projects presented by the STI players are incorporated into the directions summarized below:

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1. THREE KEYS FOR STI ACTION

Ten principles for STI action emerge from the thought process carried out by the STI players and these are articulated around 3 key points.

AN EVOLVING CONCEPTION

STI evolves extremely rapidly, both in its issues and in its needs: a prospective analysis is essential to situate the needs in the rapid modification of networks, concepts and tools. Furthermore, the practise of STI is above all a matter of qualifications and skills of the researchers and technical staff responsible for it. Training and the exchange of practices thus hold an essential location. STI design must be capable of evolving and adapting.

OPEN METHODS

STI Actions must face up to the needs of all researchers and beneficiary communities: this constraint implies formulating open methods. The approach that has been retained is that of the STI production procedure. Thus, the supply of the CNRS’ STI is successively perused as it is built up against the resources present in the BSN task-forces and in the specialized Units of the DIST (INIST, Persée, CCSD). Furthermore, it is assessed against the supply present in the Institutes, or in the major external resources (calculation resources, large shared databases of the ISTEX type) of which there are as many as there are STI supply access conditions. The STI methods are also the choice of access to publications for diverse research communities and the support that is supplied to them. These are, finally, the concepts that ensure the traceability and listing of scientific publications. The Open Access approach is present at all levels, while being the object of a medium-term global strategy. The INSMI (National Institute for Mathematical Sciences) and INSU (National Institute for Earth Sciences and Astronomy) underline that this approach must be carried out with the participation of researchers and innovative solutions must be searched for.

SHARED REGULATION

STI control depends on the appropriation of production and sharing regulations, above all ethical and legal rules and laws. Co-ordination then intervenes in the sharing of metrics analysis for all Institutional monitoring requirements, with the aim of assessment and guidance. Furthermore, regulation depends on advances that innovative tools provide; the novel networks in STI. Depending on its needs, the control of the group of STI projects also calls upon a choice of governance (that of an STI Regulation Committee at the DIST has been evoked to carry out the follow-through of the STI Action Plan).
2. AN EVOLVING CONCEPTION: SHARING KNOWLEDGE AND EXPERTISE FOR THE SERVICE OF STI

DIRECTION 1: ANTICIPATING AND CREATING GLOBAL OPTIONS

ACCUMULATION OF NEEDS

It is not only the data that is in a state of "downpour": the projects associated with STI are also developing with a vigour that is often torrential.

➢ The accumulation of needs is reflected by a global requirement for bearings concerning STI direction, organization and significance of approaches. In particular, reference points are needed concerning the position to be retained in medium-term evolution.

Thus, the SOLEIL TGIR (Very large-scale research facility and infrastructure), which houses and coexists with a large number of big communities of other disciplines, highlights the need for an epistemic position to gain STI produced on the basis of digital data, new analytical tools and the sharing of knowledge.

The INEE (Institute of Ecology and Environment) remarks that there is an overabundance of information: the "incoming" and "outgoing" flows of STI have to be distinguished, since the problems of these two are distinct. What is the correct solution for access to STI both now and for the future? Should there be several sources of STI, or a unique source that regroups the others? There is no coherence of the whole at the present time and this must be found, which necessitates stepping back and putting things into perspective: the CNRS has the ability to contribute to this.

The INC (Institute of Chemistry) shows itself favourable to an analytical and strategic approach of publications by the Institutes, by the devising of appropriate metric tools. It is followed in this optic by a majority of the Institutes and the INEE has led a first experimental approach in this sense.

The IN2P3 (National Institute of Nuclear and Particle Physics) and the INP (Institute of Physics) both recommend the need to reach for Open Access by a global approach established from immediate, solid and shared experiments, through initiatives such as SCOAP3.

The INS2I (Institute for Information Sciences and Technologies) considers that a reference point is needed for the whole search for tools, for modelling of data sources and for publications.

The INSIS (Institute for Engineering and Systems Sciences) underlines the need to explore new scientific domains on a world-wide scale, to develop technological monitoring and bibliometric analysis, to enter deeply into the mastery of developmental tools, notably patents, and to re-evaluate to that end the analysis of existing national concepts.
The **INSB** (Institute of Biological Sciences) reports a relationship developed by the solution of Open Archives (PubMedCentral), systematic publication in major international journals and access to the large databases. Numerous ethical and legal questions that arise in the life sciences merit a constructed approach by the CNRS.

The **INSHS** (Institute for Humanities and Social Sciences) underlines the need for shared reference points and common rules, measuring out incitation and obligation, founding the sharing of STI on a clear vision of the models available and accessible in the short to medium-term based on the main strategic STI topics.

The **INSMI** (National Institute for Mathematical Sciences) recommends the construction of an integrated and global digital approach to STI (from publishing to the search for data). Furthermore, INSMI notes that there is a need to progress and to share knowledge on the structure of data and the heterogeneity of observations, the latter being a base condition for the development of data produced by STI. For all that, it is necessary to integrate in the long-term (and thus to finance) print libraries and the specialists of these documents with the new numerical libraries in their diverse forms.

According to the **INSU** (National Institute for Earth Sciences and Astronomy), "solid foundations" should be built to support transversality and adherence of different disciplines. For example, the INSU organizes its Sciences of the Planet data services in thematic "data poles", in collaboration with the other organizations implicated (CNES, Ifremer, etc.), and has appointed an Affairs Officer to follow the problem of data at the Institutional scale.

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**A COHERENT PROSPECTIVE PROJECT**

The CNRS’ positions are driving forces in the definition and promotion of national, European and international positions in favour of a shared STI.

As the global reports have highlighted, the CNRS is uppermost in all national, European and international forums where the project of Open Science progresses. These positions can rely on resources and internal reflections that develop just as many general operational policies. The difficulties of ensuring global coherence of the positions in favour of Open Science are not underestimated, as is demonstrated by the ongoing steps in negotiations on Open Access (see action principle 8).

An internal reflection to benefit the operational implementation of these options is emerging.
A global scientific communication effort needs to be constructed. The Cléo\(^{25}\) underlines the necessity to structure a national and European policy of a vision on several bases, which together determine the modernization of the scientific communication system. The Cléo also observes that it is now time to act by introducing "radical innovations into the ecosystem". The development of Open Access should rely on true incitements for the researcher (audit, endowment, advancement), with the principal of a bonus for Open Access, promotion of "open peer-review" whenever possible and of new forms of publishing (for example, academic blogs). Furthermore, it should encompass modernization of the technological devices underlying the scientific communication system in document (DOI) and author (ORCID, Idref, ISNI etc.) identification, definition of the concepts centred on the user, interoperability between instruments (inspired by the Huma-Num gains) and the pertinence of STI indicators, perennial filing.

The **TGIR Huma-Num** implements a global approach to SHS: effectively, the TGIR supports Dariah’s (*Digital Research Infrastructure for the Arts and Humanities*) European Research Infrastructure Consortium (ERIC).

The **INIST (Institute for Scientific and Technical Information)** has available a rich experience of documentary products and engineering services for the support and backing of platforms and services, for the development of documentary tools, norms and standards to favour their interoperability. At the beginning of 2014, in liaison with INIST and the CNRS Institutes, the **DIST** is planning to set up a contact assignment in America on the theme of resources and projects in the matter of STI forecasting (previsions, audits, and work in progress).

**International, European and national positions in favour of Open Science** are strengthened by the magnitude of needs and quality of implementation propositions. These positions rely on upstream support from the MESR action in the BSN framework.

The Strategic Orientation Plan depends on the BSN national project, whose programme notes: "The sector of scientific publishing has been totally disrupted in both economic and heuristic designs by the new means of dissemination of knowledge. (...) Traditional thought processes have been replaced by a group of customs that merit encouragement as long as the indispensable freedom of the scientific practice is conserved, along with the quality of scientific production validation procedures". In this sense, the BSN 7 task-force leads a global monitoring of scientific digital publishing and has set up a national resource, namely the Board of digital scientific publishing. A national enquiry has been started concerning scientific publishing: the CNRS participates actively in this.

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\(^{25}\) Centre for Open Electronic Publishing [http://cleo.openedition.org/](http://cleo.openedition.org/)
CREATING AN IDEAL FORWARD-LOOKING MEDIUM-TERM STI

Based on its internal reflection, by sharing it with its partners, the CNRS can anticipate fleshing-out a forward-looking STI approach based on the strategies of purchase and access to resources, on shared knowledge in bibliometrics (BSN 3), on the national policy of scientific publishing (BSN 7) and on taking into account the transversality of Open Access (BSN 4). This approach will depend on internal reflection and on the skills of its operators, as well as on the invaluable attainment of the research organizations that are shared in the context of the EPRIST association. Furthermore, it will call upon the cooperation of ABES and the Couperin Consortium. When it is established, this approach should allow an understanding of medium-term perspectives for STI and the situation in terms of audits and national and international tasks, notably concerning:

- the progression of documentary policies for major research organizations and Universities abroad,
- analytical tools for the corpus of data and publications,
- the production partners of STI services for research and development,
- international standards applicable to documents, data, bases etc.
- national and international strategies of major foreign research organizations in the matter of STI.

This list is not exhaustive. The themes on which this approach will focus will be defined in relation with the Institutes, to allow the CNRS to rapidly have the results of this investment that is essential to build and share with its partners the development of its medium-term vision of STI projects.
DIRECTION 2: ADAPTING KNOWLEDGE AND EXPERTISE

Adapting knowledge and competences is obviously essential in a world where STI changes have been, are, and probably will still be in the future, extremely rapid. The question is critical at the level of STI staff, along with researchers who also experience a need for methodological support.

TRAINING ACTIONS AND THE EXCHANGE OF KNOWLEDGE

The CNRS benefits from the support of employees formed in STI actions. These come under the jurisdiction of several professional families, whose revision is underway in the MESR with the active cooperation of the CNRS (OMES).

Furthermore, the Organization benefits from synergies caused by the highly dynamic networking of these employees, notably in the national networks of: Renatis, Medici, RBDD, RNBM, Démocrite and Docplanets. These networks, along with the different regional networks and themes of the staff, are particularly present in the national reflection concerning the future of STI.

It is true that this reflection is in agreement with the professional preoccupations of career and qualification progression imposed by the business and technological models of STI. In this context, the networks have brought to the CNRS both a rich and a diversified experience of staff present in all the research communities and, in a particularly timely and beneficial manner, an up-to-date expertise concerning the new STI models, notably those associated with research data.

In this sense, the STI employees immediately showed themselves to be participants in the changes under way. They take an active part in the definition of training requirements in which the perspective, laboratory work environment and connection to the researchers’ needs are spontaneously integrated. The interest of these opportunities must obviously be underlined in the frame of the Strategic Orientation Plan, to which the network members actively participated. Its follow-up must be intensified in close relation with the Unit Director.

RE-EVALUATING QUALIFICATIONS AND EMPLOYMENT PROFILES

At the 31st of December 2012, the STI staff working for the CNRS had a large range of abilities, with the following global characteristics:

- a substantial amount of personnel (770 Engineers, Technicians and Administrative [ITA] CNRS staff and 132 non-CNRS members) clearly identified as working
in STI. These are in the "BAP" (Branch of Professional Activity) F (families A and C)\(^{26}\)^{27},

- staff not identified as STI, but who ensure information technology functions indispensable to STI (notably certain "BAP" E staff) or who work specifically on STI for a highly specialized Scientific Institute (for example, certain staff of the "BAP" D A, B and C families\(^{28}\)),

- personnel of a high qualification level (approximately half of the CNRS "BAP" F family A staff are Engineers [IE] or Research Engineers [IR]), often of double or triple expertise (scientific, computing, STI) with very varied profiles: certain IR, (but also AI [Assistant Engineer] and IE, according to l'INSU), carry out publication capture in INEE’s opinion. The SHS STI correspondents are most often "BAP" F ITA, but there are also "BAP" D staff and researchers.

These employees are in the majority women and are unequally distributed within the Institutes and within the Units. Approximately half the personnel engaged in STI activities are over 50 years old, with local progressive disappearance of the function notably in the INSU (National Institute for Earth Sciences and Astronomy) Joint Research Units (UMRs). Pioneering examples, such as that of the CDS, show the important impact of "BAP" F trained librarians in managing scientific data for the provision of research results. For InSHS, the spectrum of qualification analysis extends across "BAP" D, F and E. There is a strategic human resources task-force to build around training, professional advancement and the development of careers, the three notions being linked. The future of lesser qualified staff is a sensitive and major question.

The DIST investigation agrees with the established opinion, according to which there is a local difficulty to develop synergy between the STI staff expertise and researchers' needs. The idea has often been expressed that these two categories of STI players needed to intensify, or even renew, an efficient collaborative relationship at the initiative of the Unit Director. The staff expressed clearly a desire to advance their careers and their qualifications to the service of STI.

Action Principles 2.1

\(^{26}\) BAP F: Documentation, publishing, communication. Family A: STI, heritage collections. Family C: multi-support publishing, printing, graphics

\(^{27}\) Source: Labintel of 31/12/2012, treated by the CNRS / SAPPs

\(^{28}\) BAP D: SHS. Family A: treatment and analysis of databases. Family B: treatment, analysis and representation of space information. Family C: analysis of written, iconographical and oral sources
The BSN 9 group, entitled "Training, Expertise and Use", answers the need to take into account questions of training linked to the different BSN task-forces. It has concentrated to date on the description of the training in Digital Scientific Information public supply and on the drawing up of sheets of scientific information proficiency, in the context of the national reference document concerning types of post in Research and Higher Education (REFERENS):

- Re-define the job descriptions of STI professionals in relation to BSN 9 and REFERENS (without neglecting the less-qualified staff) and share the offer of training, notably in the Universities,
- Install actions to renew the relation with researchers underscoring the added value brought by the STI professionals.

**DEFINING A NATIONAL TRAINING PLAN FOR STI**

Given the characteristics of the CNRS staff, there is no alternative other than a remobilization to the service of STI: this is clearly a necessary and profitable investment. The networks of STI employees have answered the DIST in the sense of a national STI training Plan, which could be the occasion to create multiple partnerships for the service of STI. In InSHS, the web of STI correspondents in the laboratories counts today 183 representatives designated by the laboratory head for 280 laboratories (the circulation list can be found on the web site [http://corist-shs.cnrs.fr](http://corist-shs.cnrs.fr)), and this is an essential force to reinforce the action.

Highly active networks of the profession exist:

- at the national level (Renatis\(^{29}\), Medici\(^{30}\), RBDD\(^{31}\), URFIST\(^{32}\))
- at the regional level (ARPIST, GO!Doc, Isidora, Mistral, Doccitanist, etc.)
- themes (DEMOCRITE, RNBM, Docplanets, etc.)

These networks concentrate on problems that arise from the progression of the profession, the STI potential and the adaptation of tools, expertise and services proposed to the researcher. These aspects are notably managed via training initiatives like FRéDoc\(^{33}\), ANFs (National Training Actions) or task-force groups. Training offers are numerous and diverse on the internal CNRS plan (INSHS, STI operators) as well as external ones (no-

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32 URFIST : Regional Unit of Training in Scientific and Technical Information: [http://urfist.enc.sorbonne.fr](http://urfist.enc.sorbonne.fr/)
33 FRéDoc 2013, for example, on the theme of "administration and development of research data". [http://renatis.cnrs.fr/spip.php?rubrique78](http://renatis.cnrs.fr/spip.php?rubrique78)
ably URFIST). The Institutes have a training policy that can be shared like the policy at the InSHS which runs 4 to 5 ANFs per year.

The regional networks and Renatis, the national network, are concentrated "on the actions that lead to occupational progression, on the STI perspective and the adaptation of tools, expertise and services proposed to the researcher”.

The Medici network proposes to lead a national mapping of the crafts and expertise of public scientific publishing, with the establishment of a pluriannual training plan. This network also proposes services to the Unit Directors (help with the composition of job description forms, with temporary recruitment, the management and monitoring of new staff, training propositions to stimulate the careers of "BAP" F, C family agents).

The networks of STI professionals are a force and an asset to disseminate good practices, federate and shape the communities. They are active and near to the grass roots, so are susceptible to inform the higher instances of the researchers’ needs. They play a part in STI professionals’ progression. A vigorous campaign of training in foreign languages in general, and in English in particular, is appropriate to achieve a daily cooperation between the European STI actors. Legal training and support are also indicated as being important.

- To support the professional networks, notably to succeed in articulation with the grass root communities, around steering by Unit Directors.
- To define a national training plan, relying on these networks in close relation with the Institutional STI correspondents (Corists), BSN 9 and the internal CNRS players of STI training with operators such as the INIST, Huma-Num, etc., or externally (URFIST, the CNAM and certain Universities that propose specialized training programs).

STARTING A NATIONAL ACTION ON RESEARCH DATA

In terms of research data management, developmental needs are immense and require the mobilization of the trio of STI professionals, computer engineers and scientists. Certain institutes have installed visible and reliable organizations, for example:
The INSU created the CDS\textsuperscript{34} 40 years ago, to ensure the collection and dissemination of astronomical data and associated information for the international community, and has librarians in its staff (AI, IE and IR),

The INEE installed BBEES\textsuperscript{35} that advises or intervenes in the Units for several days or months, to revive or restructure the databases of Biodiversity, Ecology, Environment and Society,

For InSHS, the TGIR Huma-Num\textsuperscript{36} favours the co-ordination of the reasoned and collective production of the source corpus (scientific recommendations, good technological practices), by the intermediary of consortiums that regroup the players of the scientific communities.

In the INSB, these training sessions are already well-structured, in conjunction with IT specialists (bioinformatics).

The usefulness of the STI professionals is marked in domains other than research data management, such as the implementation of the data Web, for example (presentation of the INRA tasks at FRéDoc2013). INS2I suggests setting up a structured data management plan with different steps, which would allow not only the mode of usage to be mastered, but also common norms in terms of storage.

The INEE observed that the needs within the laboratories are very varied and solutions must be adapted in consequence. Certain scientific communities are well-organized or are organized in terms of data management and their experience can be highly useful. The CNRS has major assets to manage efficiently research data, in terms of the necessary competences (STI, computing, scientific). Means must be found to compensate for the unequal distribution of STI employees in the field (movable teams? complementary training? regional resource centres?).

To rely on the practices and knowledge of the teams already constituted and to multiply concrete experiences in terms of management of research data, in a steering action driven by Unit Directors,

\textsuperscript{34} Strasbourg Documentation Centre \url{http://cdsweb.u-strasbg.fr/index-fr.gml}

\textsuperscript{35} The Unit of databases on Biodiversity, Ecology, Environment and Societies \url{http://bbees.mnhn.fr/} has as its aim to structure and optimize the tasks around the research databases concerning natural and cultural Biodiversity, both current and past.

\textsuperscript{36} Huma-Num \url{http://www.huma-num.fr/}
➢ To define and set up the organizations and means necessary to compensate for the impossibility to generalize for multi-competent teams (STI, computing, scientific), physically in the same location (movable team, collaborative platform, centralization of data in specialized centres etc.)

➢ To better understand the needs of the communities (INEE has put forward the idea to throw open national calls for tender, to identify the needs for example in terms of research data administration).

A HIGH PRIORITY FOR TRAINING WITHIN THE INIST

The INIST is in the process of conceiving a Plan of qualification development that will accompany the redeployment of a part of its activities towards new projects. The INIST finally needs to address the necessary adaptations of knowledge acquired in its historic tasks. A large-scale training project is thus to be envisaged.

In parallel, the INIST brings training programs to personnel in the Units.

The INIST aims to support researchers and professionals in their acquisition of new expertise and to optimize their knowledge in STI via both face to face and remote training. Furthermore, the INIST develops supports such as e-learning on a shared platform and also a training engineering system.

Principles

➢ Furthermore, the INIST seminar has confirmed a major need for training, monitoring and alerts relative to the whole spectrum of production, management and treatment of scientific production, including research data. The range of this spectrum requires the implication of expertise spread throughout the Institute. The organization and animation of a network of internal trainers is thus necessary to reply efficiently to demands.

➢ The INIST should also be able to intervene in initial training programs, or continual training sessions, for the communities (doctoral schools and researchers) and the STI professionals.
DIRECTION 3: TRAINING BY AND WITHIN RESEARCH

Generally, there are few training schedules in STI for researchers, and those that exist, which depend on training by research, are unequally distributed. These training programs are present in doctoral schools and in laboratories whose mapping remains to be determined.

Furthermore, certain services offered by the CNRS STI operators are poorly known to researchers.

For example, InSHS considers that it would be useful to raise researchers’ awareness to the broad-based issues of STI problems, train them in new STI tools, advise them of the best choices concerning information technology, provide legal guidance (good practices, contract templates, etc.). The INEE has put forward the idea of national calls for tenders to answer the needs and offer targeted training programs.

In this category of national supply, Huma-Num has proposed the idea of new services and pilot actions, based on training relays to enter fully into the web of data, the linked data. The task-force is essential. "The task of structuring the national players who offer training sessions will be decisive (Huma-Num, Cléo, INIST, CCSD). The Cléo highlights that initiatives developing good practise guides (Huma-Num, Cléo, BSN) should not only be encouraged, but should also be taken up at another scale".

A better understanding by the researchers of the challenges and the means to be used for sharing data aims both to advance individual practices and to prepare the evolution of practices of evaluation of the scientific activity, which must accompany the development of the landscape if one is to obtain an active participation of the community: the impact of data sharing, along with the time spent to prepare the data, must be recognized to be of the same value as the publication of articles in journals with a readership. Furthermore, this recognition must extend to include all researchers, including those who participate in evaluation committees.

STRUCTURING THE APPROACH OF NATIONAL PLAYERS

- To put in place actions of STI awareness and training for PhD students (doctoral schools) and researchers within laboratories.
- To structure and articulate the work of national players offering training facilities (Huma-Num, Cléo, INIST, CCSD, Persée, URFIST, OST, etc.) and to develop initiatives of advice in good practices.
At all levels of production of scientific publications, the STI action aims to bring a solution to the needs of each scientific community while creating the dynamic of common practices improving the legibility, traceability, visibility and sharing of scientific results. These approaches are all crossed by the transversal target of Open Access to the benefits of public research, for which furthermore a global medium-term strategy was developed.

**DIRECTION 4: MATCHING STI SUPPLY AND DEMAND**

Matching the STI supply and demand supposes a double movement of adaptation between the Institutes and the INIST, who could only unequally agree as to their projects. At a time when the INIST is in phase with a national STI policy that expects a great deal of its STI supply, the Institutes' demand is the reference point of reorientation of its choices, as mandated by its recent working seminar. The relationship also evolves between the other STI project promoters, on the first rank of which figures the CCSD and more recently PERSEE. As for the INIST, these two latter players that supply STI to the CNRS aim to be in phase with all the needs of higher education and research.

**THE DEMAND OF THE INSTITUTES: PROGRESSION OF NEEDS**

Access to information, economies in publication and development of STI are three themes on which the institutes have concentrated their answers. Wherever possible they are to be classed keeping the distinction put forward by the INEE, between the entering and leaving flow of STI.

**SIMPLIFYING ACCESS TO SOURCES OF DOCUMENTS**

1. **Is a unique portal needed?**

The question of this first "entering flow" that is the information received for research, is generally approached with a view to simplification. Many researchers use only a few tools for their daily tasks, particularly those that they are used to. The users of the Web of Science (WoS) form an established group that has acquired the logic of access to information by a global portal.

For the INC, in the face of the clear increase in scientific production, digitalization eases the transmission and speed but also the multiplication of the possible formats (publications in journals, production of data, software, blogs, etc.). The INS2I, INEE, IN2P3, INSB, INSIS all use electronic journals and do not have any desire for print. However, the INC also underlines the fact that researchers often have access to a number of portals that is too high. The time spent in accessing research and administration of the portals is
a supplementary constraint in access to information. The INSB, who uses the INIST "BiblioVie" portal, highlights that there are redundancies between this tool and the university portals and particularly that of INSERM.

A large majority of the Institutes has expressed the wish for a SINGLE, rapid, ergonomic and practical access to STI. They want "the tool to be rendered invisible". The influence of the large global driving forces is central (WoS and of course Google are constantly cited). The current organization proposed by the INIST is too "tubular" in that it does not allow a crosswise access to the portals. A minority of Institutes, such as IN2P3 or INSB, stated that to date they have not engaged in an ongoing relationship with the INIST.

The mathematical community is working on setting up a portal by the basis of the MathDoc cell, the RNBM network and that of Mathrice (IT specialists from mathematics units). This portal is designed to be "tailor-made", specific to the discipline, and will rely on the hub of metadata of acquired or useful collections. It is not intended to be a competitor to the unique portal but rather a complement, relying on common bases and offering wider specific services to the discipline than documentary services (notably computing services and collaborative ones proposed by Mathrice). This project is founded on the MathDoc cell expertise that has played a motor role in a similar European project (EuDML).

- To install architecture of access to STI that answers the evolution in needs in terms of information access of researchers in the Institutes and all of research.
- To develop in advance the analysis of the distribution of the flow of choice and cost (Institutes, portals, Universities etc.) starting from the section begun by the DIST and Corist with the DDAI and the DSFIM.

**PUBLICATION ECONOMICS**

1. **To optimize access to publications and scientific heritage and make them durable**

As the INC observes, "the publishing site is the researcher’s library". For the INEE, "the WoS is a researcher’s archive".

- The relationship with the major publishers and their intermediaries must be systematically enrolled within the national approaches led by the DGRI, with the strategic cooperation of ABES and the Couperin Consortium.
- To evolve and systematize the institutional negotiations and the CNRS purchase strategy in relation with MISTRD, with the support of ABES and the Couperin Consortium. To make the business model evolve to optimize the services to the researcher (simplification of access, clarification of the portals offered, of the analysis services).

2. **To conceive a strategic approach for presence at open archives**
ArXiv is much used by mathematicians, but the CNRS needs to have a strong, developed relationship with ArXiv. Thus, for the INSMI the risk exists of an ill-controlled relationship of dependency: scientific publication cannot be placed in the hands of an independent entity such as ArXiv, housed at Cornell University. The problem is of a strategic order, as this database is unique. The mirrors that exist in Europe are in the process of vanishing. If access to ArXiv encounters difficulties, scientific heritage could be threatened. For the INSU and INSMI, it is important to maintain the relationship with arXiv: an agreement seems necessary. There should be overall negotiations and a session at the Board of Trustees. Fortunately the CCSD administers one of the rare mirrors that serves as a French arXiv depository.

➢ To consolidate the possible partnerships with the major private and public open Archives (ArXiv, etc.) and the social networks (Research Gate etc.)

➢ To develop a legal regime that will protect the open archive, inspired by public law (essential infrastructures?)

3. To preserve the historic scientific heritage

Scientific archives cannot be reduced to the single digital domain and collections must be preserved in all domains where STI is present. Several disciplines (notably mathematics and physics, but also SHS), have signalled the importance of historic archiving as a necessary source for the development of science as it is constructed.

Technical know-how exists in the matter of digitalization within the INSMI (Mathdoc via the NUMDAM program): this must be maintained as it is recognized, including at the European level. Effectively, it is Mathdoc that has imposed the metadata standard defined for the EUDML project. This also corresponds to a need since fundamental resources in mathematics are not yet digitalized and are not covered by the ISTEX project.

In the InSHS, the MESR Persée programme is dedicated to the digitalization of scientific archives in the humanities and social sciences and has been enlarged with the support of the CNRS, ENS and the CUE of Lyon, under the aegis of BSN 5. The INSU also has needs, particularly concerning geological journals. This category of needs does not only concern publications: for example, the INSB participates in the European bio-banks of sequencing database repositories.

In the IN2P3, InSHS, INP, INSMI and RNBM, print is the preferred format: it is important to conserve at least one, and preferably two, hard copies for the whole of France, if only until stable and reliable solutions of digital archiving are set up. The RNBM is working (in partnership with the CTLes) on the installation of a national plan for the shared conservation of print periodicals to ensure the longevity of these collections and to allow their circulation via the supply of documents. The aim is to limit redundancies but also to organ-
ize at the national level the systematic maintenance and perennial conservation of several collections, covering the most important titles in the discipline.

➢ To construct a coherent and interdisciplinary national programme of preservation of the historic scientific heritage, including a perennial archive (in collaboration with BSN 6).

4. To ensure the longevity of academic publishing of journals of quality

The move to Open Access is difficult for journals and academic publishers and a large number of learned societies refuse to pay the author.

The INC and INSMI are in favour of the formulation of a Charter of relationships with the publishers of learned societies, founded on notions of excellence, complementarity (a need not satisfied by other editorial spheres) and the weight the CNRS brings to bear in purchasing and publication. In the INSMI, the national and international academic publishing production is rich and abundant and needs to be taken into account.

➢ To define a common position, after an enquiry into the size of requirements. To participate actively in the BSN 7 national enquiry.

➢ To refer to the INC recommendations and the Charter of good practices developed by the BSN 7 task-force.

➢ To support emerging projects (Episciences.org (mathematics and computing) the Journal of the Ecole Polytechnique etc.) and/or subsidise journals, pooling together knowledge.

5. To reinforce the negotiation of local acquisitions

The InSHS has chosen to negotiate itself its journals with CAIRN, to be able to remain firm as to the area of journals to acquire. It has been suggested that a researcher should be included in the scope of negotiations as and when it is necessary. The INSHS aims to provide acquisitions and subscriptions that are as near as possible to the needs of the researchers and the laboratories.

The RNBM attempted to do this, by bringing scientific scrutiny into the negotiation with Springer. Legal support for the institutes that enter into negotiations is needed.

The INSMI is in the process of setting up a pooled organization to ensure the permanency of the services offered by the three learned societies (French and European) the nearest to the community.
Beyond the critical observations concerning the "journal bundles" proposed by the publishers, the general request of the Institutes is to approach more closely the needs of the researcher, by a constructed approach made available by the Unit Director.

- To put in place tools and procedures to ensure the visibility and simplification of local approaches to document acquisition, with the cooperation of the DSFIM.
- To share approaches with the partners of the CNRS in the laboratories.

### PROMOTION OF SCIENTIFIC INFORMATION

A vast subject, the question of promotion is attacked here from the angle of immediate concerns: open archives, services and tools unequally mobilized that are created for the researcher in his daily work. A clear national approach is often recommended. The central question of the affiliation of publications will be discussed separately.

1. Promotion by the institution

Like other Institutes, IN2P3 expressed an option of principle favourable to deposits in HAL (the INSIS and INSB expressed reserves). The InSHS strongly supports the deposit in HAL. Nevertheless, the approach let to precise questions and suggestions. Apart from the question of durability mentioned earlier, depositing in the open archives raises two kinds of question: the opportunity of a national approach and the quality of services associated with the deposit. Thus, the INEE, which supplies HAL, notes that all scientific production is not indexed on HAL; that the service supplied is currently limited to a census of previously deposited publications. The INP, along with the INSU, raises the question of the necessity to improve simple "cross-linking" between HAL and arXiv, to ensure a pertinence and completeness of deposits and to thus boost the national project supported by the MESR and the French Academy of Sciences.

Faced with this national approach of access to open science, the promotion of publications requires several recommendations which dovetail:

- To put in place a reflection of the Organization pertaining to the rules of deposit in HAL: should we be heading for an automatic, systematic deposit? According to what rules applicable locally in the laboratories?
- Which support services to Open Access should be developed in an optic of those for deposit in the open archives ("Open Process")?

2. Promotion by tools created for the researcher

Researchers find themselves confronted with numerous tools to promote their production, arising from the private market in free communities, in social networks (Research Gate and Orcid, Scopus, ResearchID, LinkedIn, etc.). These tools can generate thematic
classifications of the researchers and their publications and at the same time put researchers in relation with each other. Mendeley, for example, allows automatic reference lists to be generated, a reference list to be managed in collaboration with other researchers, references to be sorted and to remain in relation with ones’ community.

Alert mechanisms for publications in the field of researchers' ongoing work are generally requested, except in the communities such as physics, where the number of publishing scientists is known, limited and relatively stable (the figure of an increase in publications of +5% per year has been cited).

Finally, a growing approach that is underway puts the accent on "alternative" metrics (Altmetrics). This relies on the practices of the researchers and analyses (particularly preferences and opinions). There is also room for heuristic analyses and their developments that are under way (Meta- and Hyper-heuristics born in industrial research applications).

- To develop a comparative analysis of the tools for promoting publications, evaluate the risks and advantages and share the usage as well as "putting on the market" common or shared tools by research communities,
- To link this evaluation to the STI prospective (action principal 1),
- To develop the practices and usages associated with new metrics (recommendation of the Cléo cited above). To promote the development of "Altmetrics" that is underway.

**REWORKING OF THE SUPPLY: INIST RENOVATED, A NATIONAL PROJECT**

In close relationship with the DIST, in touch with all the needs of the CNRS and research, the INIST has taken the full measure of its position in the CNRS STI Strategic Orientation Plan and, through this approach, of its position in the whole sphere of Higher Education and Research.

These perspectives are inscribed in a strong territorial anchorage, namely an STI pole of excellence in Lorraine. The INIST, in association with University partners, particularly the University of Lorraine, has assets to develop the STI excellence pole that is vital at the national level. This belief depends on the skills that the INIST has developed but also on the presence of high quality research on the automatic processing of languages within the ATILF and the LORIA (more specifically in its "Natural language processing" department). The presence of the CREM, a high quality research laboratory in sciences of information and communication completes these resources.

The reform of the supply, prepared by a strategic Seminar where the INIST compared its analyses with the Institutes and with the DIST, has been approached in a pragmatic way by the type of service.
1. Re-organization of the portals

The INIST is an active stakeholder in the thought-process undertaken by the DIST concerning conditions and modalities of a re-organization of the documentary supply of existing portals. This reflection, which must be carried out with the institutes, should lead in the short-term to new propositions. It is to be established in the context of an Action Plan defined as an offer for the benefit of the largest possible group of researchers, corresponding to their needs and taking into account the specific requirements of each community. The presence of representatives of all the ESR in the Action Plan should provide this reflection with the framework of decisions optimized for the beginning of 2014.

➢ To put in place the steering group of a re-organization of the portals, comprising the actual participation of the Institutes and the research partners of the CNRS (Universities, EPST etc.),

➢ To define in advance with the DSFIM and the D2AI the financial bases to be retained to encompass possible developments.

RESEARCH SUPPORT SERVICES

The INIST offers numerous services of recognized quality. Certain will be adjusted and others promoted. The whole group of services is a decisive asset in the renewal of the INIST supply and constitutes a high demand by the Institutes (documentary engineering, data curation, language engineering, monitoring, bibliometric studies, translations, training, digital publication, supply of documents, management and promotion of research data).

1. Document Supply

Document Supply allows rare articles and those that are difficult to identify and locate to be supplied. The INIST service of document supply currently attains over 96% satisfaction of orders (notably due to a network of 280 partner librarians).

➢ Under new conditions to be defined, this activity, which treats requests for rare documents or those requiring additional identification, could bring true added value to the academic mechanism managed by ABES. The integration of resources into Open Access could also be a reinforced alert lever. BSN 8 has retained as one of its priorities a better articulation between the Cadist resources and the RefDoc platform. Studies are under way.

2. Bibliographic databases
In the national framework of the BSN (Digital Scientific Library), the scope of the INIST bibliographic databases is integrated into the third segment (BSN 3) dedicated to alerts which says: "Other measures of alerts are progressively put in place, which answer specific needs or address target communities, notably (...) the databases by major disciplines (Francis, Pascal of the INIST) for the promotion of scientific production etc.". These perspectives are to be established as near as possible to the needs of the communities, units and the CNRS STI policy.

The aims are:

- To establish a link between the databases and the full text of research data,
- To produce a schema of re-positioning relative to the INIST supply, taking into account the current knowledge as being new in-demand trends,
- To develop the training plan necessary to accompany these developments.

3. Negotiation engineering

The engineering of digital resource purchase negotiation is an activity where the INIST benefits from nearly 10 years of acquired experience in thematic negotiations (for the portals) as well as that acquired in national negotiations (alongside Couperin, the Public Scientific and Technological Institutions or EPSTs and ABES), where the INIST represents the CNRS. These negotiations concern over 50 publishers annually (70 packages of journals or databases) to obtain reduced prices, longevity of access and the provision of usage statistics.

On this basis, the INIST can provide:

- A reflection and advice to the Institutes relative to the needs of the researcher. (The InSHS would like to see a service as near as possible to its needs, the INSIS does not express needs (except the IEEE), the IN2P3 does not have identified needs),
- The study of the cost and the different possible schemas,
- An analysis, envisaged above, of portal or portal system progression, in collaboration with the DIST (Scientific and Technical Information Department), DSFIM (Financial Strategy, Real Estate and Modernization Department), DDAI (Purchasing and Innovation Office) and COUPERIN, with the elimination of CNRS internal redundancies, highlighting of the opportunity for grouped orders, a task-force on communication to inform the laboratories of the possibilities, of the existing state and its evolution and finally a reduction of the double irrigation with respect to the universities.
4. Tailor-made services

The INIST can also complete the supply in the form of services that are tailor-made to the researchers' requirements, by accompanying the information professionals present in the laboratories in terms of methodological and technological advice (recommending tools, help in their use, alerts).

5. Strategic monitoring of STI


The expected progresses aim to place this package in the centre of the CNRS and its partners' STI approach, to turn it into the tool of all ongoing progressions, towards "a better sharing of knowledge". This progression implies:

- Reinforcing visibility: contact is made with the DSI to increase the visibility via the research motors,
- Integrating scientific studies on the metrics used, alerts concerning the tools available to the researchers, expertise on advanced knowledge of the content of a journal or a conference,
- Writing FAQs which sum subjects up,
- Creating a network of correspondents to supply the 2 Research Data and Open Access sites, communicating to make them known, translating the reference texts, restructuring the sites to highlight the scientific domains.

6. Scientific terminology

Initially issued from the activities linked to the development of the databases and their indexation, scientific terminology constitutes a reservoir to make available to the whole ESR community. Since 2005, the TermSciences portal (a platform that has unfortunately remained frozen) enhances and renders accessible the INIST vocabularies and those of different research partners and of public institutions (INRA, IRSTEA, Inserm) by allowing their terminological alignment.

Furthermore, the INIST is involved in R&D and future investment projects, integrating a large part of text mining to propose an access elaborated to the scientific knowledge described in the publications that the INIST makes available to the community. The current projects are:

- ISTEX: enrichment of texts by the recognition of terms, named entities, citations, necessary for the development of value added services,
➤ Quareo: annotation of texts and development of semantic analytical tools for scientific texts,

➤ ANR TermITH (Terminology and Indexation of Texts in the Humanities): access to digital document information through key words deriving from terms that it contains, which supposes a recognition, disambiguation and analysis of terms,

➤ UBIK: detection and characterization of cross-discipline vocabulary, a complementary approach to work on terminologies.

The INIST must develop a good expertise by collaborating with the best research teams in the domain as part of projects relating to the development and management of terminological resources, natural language processing, extraction and administration of knowledge.

The applications of these techniques of language engineering are multiple in the services that the INIST can bring to the community. One section of the INIST Action Plans will be developed with the aim of describing the services offered according to the following aims:

➤ To facilitate a precise access to the information desired via functionalities of semantic research,

➤ To improve the visibility and the referencing of research production and data, via content-rich annotation,

➤ To facilitate the analysis of scientific production content and the treatment of large volumes, for example for the needs of monitoring or of scientific steering.

7. Research in STI

This research is organized around three axes: applied mathematics, symbolic and digital techniques of artificial intelligence and Natural Language Processing.

The work concerns the thematic analysis of the scientific corpus, the detection of themes and emerging technologies, help with the management of calls for project tenders, notably by the development of new bibliometric and infometric indicators implementing and combining numerical approaches of static and incremental classification with approaches of automatic text treatment.

➤ To define a project of sharing results and of research promotion.
DIRECTION 5: SHARING THE HAL AND PERSEE COMMON RESOURCES

HAL is the national package of the open publications archives: all expectations regarding the development of shared public research are concentrated on this infrastructure.

THE PROGRESSION OF SERVICES OFFERED IN OPEN ACCESS

The CCSD aims to define the services of "Open Process", which moreover can be promoted by a strong incitation to deposit. The interest of the researcher to deposit in HAL must be greatly developed. To this end, it is appropriate to:

- Make the tool attractive and invisible.

The deposit is facilitated (easy extraction irrespective of the choice of format, interaction with the habitual platforms of the researchers PubMedCentral, ArXiv, Openaire plus, recovery of metadata from existing reservoirs [bibliographic software or large institutional bases, publishers, etc.], link a publication to its sources, data, material etc.

- New "Open Process" services

These kinds of services are planned by the CCSD: Developing Interoperability procedures, Improving depositing procedures, Improving services to researchers (statistics, CV, bibliography). It would undoubtedly be best to boost this positive internal policy through a national level study of Open Access services which the CNRS could run with all its partners as part of the STI Action Plan. The CCSD also plays an important role in innovative Open Access model projects like the epi-journals initiative.

- Developing the right level of incentives to act driven by the supervisory authorities

A national level study is needed to define the right level of required standards. This whole policy remains to be constructed throughout higher education and research as well as internally at the CNRS.

POSITIONING FOR THE CCSD

The CCSD (Centre for direct scientific communication) was set up in 2000 to facilitate and promote direct communication between researchers. Researchers can deposit their scientific articles in the green open archive HAL, thus making STI available for the whole community. The CCSD has moved from the status of UPS (Intramural Research Unit) to UMS (Joint Service Unit) and the institutional archive HAL (Online Hyper Articles) was redefined in the inter-institutional convention signed on April 2nd 2013 by a group of rep-
resentative partners from the whole sphere of higher education and research. The CCSD's function is to implement CNRS strategy on open archives and make its expertise available for higher education and research institutions. Its main mission is centred on the development, exploitation and evolution of open archives such as HAL, TEL or MediHAL. The CCSD has strong partnerships with ABES (*Bibliographic Agency for Higher Education*), CINES (*National Computing Centre for Higher Education*), Huma-Num, the Cleo and the Inria (*French National Institute for Research in Computer Science and Control*).

- The CCSD's projects are designed and run to promote and facilitate the development of Open Access. France has chosen to give strong support to the OA green route and HAL complies with this policy particularly by respecting BOAI recommendations on implementing open archives.
- HAL accepts a broad typology of documents to be deposited which correspond to forms of scientific usage. This includes the deposits of both pre-prints and published documents.
- To guarantee a minimum scientific level and the quality of the required metadata, the CCSD moderates and checks all documents deposited particularly verifying rights for putting published articles online.
- HAL is regularly used as a research corpus. Here too, implementing data mining and reporting tools would facilitate and promote searches.

**POSITIONING FOR PERSEE**

The national-scale programme Persée was set up in 2003 by the French Higher Education and Research Ministry and confirmed in its role in 2007. Persée works on the digitalisation, document processing, dissemination and long-term preservation of retrospective collections of French language humanities and social sciences journals and publications (serial journals, conference proceedings) for free, non-exclusive dissemination. There was a change in Persée's institutional backing and status - it became a UMS (*Joint service unit*) made up of those involved locally and nationally - which provided an opportunity for it to go a step further and define a new short- and medium-term development strategy reconciling its national mission with its strong roots in the Lyon higher education hub. Persée is strongly involved in the BSN (*Digital Scientific Library*) research infrastructure for documents (BSN 5) and will also be taking part in the CollEX infrastructure (Excellence collections etc.).

Persée develops interactive relationships with French STI players, sharing the same values as the CCSD, Cleo and the MathDoc cell's NUMDAM programme particularly regarding involvement in the Open Access movement and therefore the free dissemination of scientific documents. Indeed the Persée UMS and the Huma-Num TGIR (*Very Large-
Scale Research Infrastructure) are highly complementary and this could be expressed through:

- exchanges of experiences in modelling data and metadata, indexing methods and identifying documents,
- creating bridges between platforms (NUMDAM, CCSD, Cleo) through cross-referencing documents and union lists of authors.

### SERVICES PROVIDED BY PERSEE

Persée's aims are to create, enrich and disseminate long-term digital scientific corpora with associated indexing, search and exploitation tools. This offer of services responds to the requirements of researchers in all scientific fields. As such the Unit particularly works on:

- The development of long-term structured provision of digital scientific documents in Open Access,
- Innovating by creating tools and methods and accompanying the emergence of new digital usage behaviour.

Persée also provides national-level consulting, training and support for projects constructing digital scientific corpora for research.

- The aim is to become a national reference and skills hub.

It drives technological innovation by:

- Designing and developing a generic system to host the production, processing, dissemination and archiving of different types of scientific resources based on experience acquired managing the Persée programme (www.persee.fr),
- Facilitating transversal usage by setting up common technological foundations: multi-corpus navigation or searches, mutualised enrichment of existing data and a transdisciplinary approach to corpora,
- Developing indexing and search tools,
- Collaboration with research teams in the areas of:
  - Information sciences and knowledge engineering,
  - The semantic web,
  - Modelling social systems based on large amounts of data.

However Persée also drives innovation in the legal sphere because it operates in a complex legal context which is unpredictable and hard to make evolve. The Persée Joint Service Unit does not just work with copyright-free corpora, it also manages documents which may be covered by copyright and therefore legal issues are a central part of its work. With such documents, the rights holders and the type of copyright involved need to
be identified and the necessary assignment of rights organised to pave the way for Open
Access dissemination. This requires:

- Prior feasibility studies,
- Constant study of how authors’ copyright legislation may evolve.
PROMOTING AND SHARING RESEARCH DATA

ENLARGED SCOPE

Before moving onto a discussion of the Institutes’ requirements and demand, the questions asked of the STI sphere by the proliferation of data require answers on several levels each of which need constructed strategies and initiatives. BSN 10 will help establish common charters for all involved. This initiative came slightly before European Union guidelines for 2014 on data and access thereto, following 2013’s guidelines on publications.

These bodies will work at different levels to establish a common set of rules which are becoming known and respected in disciplines which are the most advanced in the web of data.

The generic subjects for work that needs to be done on sharing research data can be listed in the following order:

- What data should be shared?
- Defining the life cycle of data,
- Guaranteeing links between publications and data,
- Increasing the awareness of researchers about managing their scientific production (including ethics),
- Implementing data management plans,
- Taking part in the definition and application of norms and standards for description, citation, quality, interoperability etc.
- Providing information on the intellectual property rights which apply to data,
- Providing long-term data preservation adapted to the different requirements of scientific communities,
- Setting up and maintaining adequate technical infrastructures,
- Taking data management into account as an evaluation criterion for researchers,
- Starting skills management and training plans for research support personnel.

A STRONG OVERALL DEMAND FROM THE INSTITUTES

The INEE (Institute of Ecology and Environment) has partnerships with major international databases like GBIF or WOORS and has a policy for systematic data promotion. For example, SCAR-MarBIN is a portal for interoperable databases which the CNRS contributes to by supplying data while Belgium provides the necessary infrastructure. Zookeys and Phytokeys are journals which publish articles from databases automatically.

According to the INEE, a definition is needed of how the CNRS can promote data becoming openly available with an obligation to cite authors while admitting that some data is too sensitive for dissemination. Data can be seen as "an ally" for publications insofar
as it systematically completes the test and counter-testing process required for scientific work (INEE, INSIS, INSB, INP).

The IN2P3 (National Institute of Nuclear and Particle Physics) does not publish raw data (unreadable for third parties) but data management plans are known and used there. The SOLEIL TGIR (Very large-scale research infrastructure) also expressed on a requirement which goes further than data management and concerns rules for long-term data preservation.

The INSB (Institute of Biological Sciences) has bio-computing partnerships with national infrastructures like Inria covering biological and biomedical (biobanks) resources. Access to data is a familiar subject (protein sequencing and structure). The INS2I (Institute for Information Sciences and Technologies) stressed the fact that the question of data curation is both important and sensitive in nature.

The INSU (National Institute for Earth Sciences and Astronomy) produces databases and has partnerships with international databases in fields like astronomy, seismology or geochemistry and would like to see more promotion of publications linked to these databases. Other bases require data preservation to be ensured and promotion of that data.

The INSHS (Institute for Humanities and Social Sciences) stressed the importance of a CNRS roadmap on the subject.

For the InSHS, it is essential to preserve databases produced in laboratories. The Institute would like to develop a cooperation project with INIST to respond to laboratories' requirements concerning the preservation and interoperability of databases and thus eventually facilitate the dissemination of research data. It seems necessary to set up working trios made up of a document specialist, an IT specialist and a researcher to help laboratories achieve long-term preservation of SHS databases. This is a recurrent request from units and should be one of our priority objectives.

Finally the INSHS considers it necessary to strengthen infrastructures like Huma-Num, Progedo-Quetelet network or excellence programmes (Biblissima http://www.biblissima-condorcet.fr/) by stabilizing the role played by the network of MSHs (Maisons des Sciences de l’Homme). We also need to support and accompany STI support personnel in how their work on data research management evolves.

The INSMI (National Institute for Mathematical Sciences) uses few generalist databases like WoS or Scopus but does use two dedicated databases MathSciNet (alias Math. Reviews, published by the American mathematics society AMS) and zbMATH (alias Zentralblatt, produced by the FIZ, the Leibniz Institute for Information Infrastructure, and
commercialized by Springer) on a daily basis. There are long-lasting links between France and zbMATH, the first web version of which was developed by Mathdoc. More generally, there is much support for this European database because it limits the American hegemony (and prices). It would be conceivable to use this database in the maths portal to cover all searches for documents from the 1868-2012 period where it has a near exhaustive collection. Above and beyond working on how to preserve print documents - which is a cited as an objective - the community is aware of the stakes and limits involved with the long-term preservation of the ever-increasing quantities of digital resources whether they derive from digitalization programmes or were originally native digital documents.

A particularly relevant example of this matter is that the digital collections produced by the Mathdoc cell (NUMDAM, CEDRAM) or acquired by the RNBM or National Network of Mathematics Libraries (national contracts with Springer, EMS-PH, SMF, etc.) are currently not archived using a long-term preservation system. The CINES business model would not be suitable in this case and the Higher Education and Research Ministry would need to manage this kind of archiving for BSN-approved collections as recommended by BSN (Digital Scientific Library) groups 5 and 6. The implementation of the CLOCKSS network with partners from the European Digital Mathematics Library initiative will be studied in 2014.

- Therefore currently there is an important need for long-term preservation, a report on the existing situation and for choices to be made subsequently on what to keep. The universities and research institutes are interested in managing and making visible the databases produced in their establishments but do not have the same end applications as theme-based or institutional repositories.

- As this spectrum is very broad, we need to promote cooperation projects with partners like Huma-Num (very large-scale infrastructure dedicated to HSS research) working on the purpose of the digital humanities or the UMS (Joint Service Unit) 3468 "Biodiversity, Ecology, Environments, Societies (BBEES)".

- INIST can provide initial or continuous training for the communities (doctoral schools and researchers) and for STI professionals.

- A shared national survey of requirements is necessary.

THE NECESSITY FOR ECONOMIC AND SOCIAL PROMOTION AND DISSEMINATION

Sharing research data is now part of the more general movement towards Open Data the aim of which is to liberalise access to government data. This movement is led in France by ETALAB with whom the DIST has made preliminary contact.

Awareness of the importance of sharing research data to helping knowledge progress, particularly when that data is publically funded, is not a new development.
The Berlin declaration (2003), the OCDE principles for access to research data (2006), the Research Councils UK principles (2011), the European Commission recommendations (2012) following the "Riding the Wave" report (2010) and the OSTP directives for American federal research agencies (2013) were all recommendations, principles and even sometimes orders to share and make accessible scientific research production. Similar could be said of the European directive 2007/2/CE dated March 14th 2007 (IN-SPIRE) the aim of which was to set up a geographical information infrastructure throughout the European Commission to help protect the environment. How this is applied to the area of research data is being closely monitored by the INEE (Institute of Ecology and Environment) and the INSU (National Institute for Earth Sciences and Astronomy).

### COMMON RULES AND CONDITIONS FOR PROMOTION AND DISSEMINATION

1. **Essential common conditions**

Two kinds of conditions are apparent from the stated requirements of those involved. The first type is institutional in nature and the second individual.

   a. **Conditions linked to institutional support**

   - A federating text needs to be disseminated throughout the CNRS expressing unconditional support for research data,
   - The organization's policy on research data needs to be defined and communicated.
   
   This principle for action corresponds to the institutional necessity for a general policy text on data which defines the conditions for uploading and sharing data and sets out the legal framework and relevant business models.

   - This policy should stem from an inter-organization study, be applicable in the different institutes and provide for incentive and regulation mechanisms. It should also deal with the subjects of the visibility of the databases produced and the promotion of researchers and other staff involved in their operational maintenance.

   b. **Conditions linked to getting individuals involved**

   - Researchers need to be made aware (by their peers) of the idea of sharing their scientific production, including research data, with other researchers.
   - To promote this change and get the support of researchers and scientific communities, it is essential to develop rules for the recognition of work done on sharing, curating and disseminating research data.

2. **Conditions required regarding the environment**
a. **Conditions linked to training**

- The skills required to manage research data need to be developed in each organization.

The generalized production of digital data creates de facto important training requirements in skills like description, storage, processing or analysis. Training is required in using the technological tools to carry out these tasks and also in the methodological, legal and organizational aspects required to set up plans for data management and running infrastructures. In part this training should be the same for the three types of personnel involved in efficient infrastructure management namely scientists, IT specialists and information professionals. Data description also requires scientific knowledge.

b. **Conditions linked to data management**

- Implementing data management plans at the design stage of research projects. The aim of this principle is that researchers should already take into account methods for the storage, description, sharing and archiving of the data to be collected and processed right from the very start of their projects. A data management plan is increasingly required for responses to calls for projects. It is based on an awareness of the data’s life cycle and should set out the rules to be applied concerning metadata standards, database format, the methods for access to and security of data, archiving duration and associated costs.

- Particular emphasis must be given to the subject of data used to support publications and which should therefore remain as widely available and accessible as possible. Support personnel like IT specialists and STI professionals are required for these tasks.

c. **Conditions linked to infrastructures**

For disciplines in which Big Data is involved (HEP for example), calculation infrastructures carry out the basic data management functions (storage, back-up) but this rarely lasts longer than the life of the projects themselves. A data infrastructure really should include points like long-term preservation, rules for sharing and reuse or access management in its services. The following are required:

- To identify existing structures which already fulfil certain functions.
- To define and operate data infrastructures which can respond to an organization’s requirements.
➢ To possess storage, uploading and long-term preservation functions ensuring the integrity of data and enabling it to be shared throughout and after the project.
➢ Big Data projects rely on processing infrastructures which also stock the data but this is not the case for many "small data" projects with data management solutions which are less secure and more short term.
➢ The aim then is to offer a package of services which may be linked with calculation services or not and which rely on the means of laboratories, centres like CC-IN2P3 or CINES and also INIST and the CNRS cloud.

d. Conditions linked to STI research and analysis of calculation capacities

➢ To make progress in the open access to, sharing and use of research data, active applied research is needed including the development of knowledge engineering. The "development of advanced tools" section of the ISTEX project is the most striking example.
➢ Similarly it is important to ask the CNRS to develop a forward-looking approach to calculation capacities available internally (COCIN - Calculation Orientation Committee, DSI - Information Systems Department), at RENATER (French National Telecommunications Network for Technology, Education and Research) and also particularly through working with GENCI (National High-Performance Computing organization) with 600 projects currently submitted.
DIRECTION 7: IDENTIFYING AND ANALYSING PUBLICATIONS

The DASTR through the SAPPS (Supporting Service for Scientific Prospective & Policy) is working on defining a coherent affiliations policy which is a major factor in the optimisation of all the stages of construction of the STI project. This is a truism but still there are differences in practices which are problematic given the importance of the stakes. In general, the CNRS’s internal thinking has shown the ambition and resolution to progress towards positions which ensure the clear national and international traceability of its scientific production of an average of around 29,000 articles per year.

UNCOORDINATED PRACTICES

Finding, evaluating and listing publications is carried out by various different people in different ways and for multiple end uses:

- Scientific communication between researchers. For example, researchers at the IN2P3 (National Institute of Nuclear and Particle Physics) or the INSMI (National Institute for Mathematical Sciences) deposit articles in ArXiv.
- Description of research activity. This is entered into the RIBAC application by humanities and social sciences researchers
- Indexing and making texts available in open access. Promotion, and bibliographic management (HAL in all fields)
- Bibliometric studies and support for steering (tracking on the WoS by SAPPS and INIST bibliometric specialists)
- CNRS researchers’ individual evaluations of documents (deposit on researchers’ lists using the e-evaluation application)
- Evaluation at unit level or application for funding (using different means such as application files, online forms to be filled in).

However the CNRS does not possess an exhaustive listing of its publications. Also the institutes do not always have an overall vision of publications (the INC has pointed this

37 Department for the Territorial Organization of Research
39 Recueil d’Informations pour un Observatoire des Activités de Recherche en SHS = Information gathered for a humanities and social sciences research observatory.
out for example) and would be in favour of tools for bibliographic management being made available for researchers (this is the case of the INEE for example).

Bibliometric indicators (distribution according to institutes, interdisciplinary links, national or regional shares, international collaborations etc.) are produced by the SAPPS and are widely used.

A more precisely targeted requirement has been expressed by certain institutes (INSB for example) for affiliations to be tracked on the database derived from the WoS according to the CNRS units concerned. Other measurement methods would also apparently be welcomed as France is not always ranked as well as it might be. This is the case of the IN2P3 which publishes quality articles in a relatively small quantity. Currently, several institutes have carried out analyses of publications based on the WoS (particularly INEE and INP) to find out more about the activity of these units or detect collaborations between units for example using their available tools. The INSB for example has expressed the wish to promote its research better and sees the way affiliations are written as a central issue for this.

The researchers use analysis tools or citation or particularly popularity indicators (Google scholar, Publish or perish, Research Gate, the WoS H-Index etc.) and there is a strong demand along these lines. On several occasions, people have recommended that the obligation to cite the name CNRS should be included in contracts between the CNRS and its partners but in practice this has not always been the case.

CONVERGENCE TO BE CONSTRUCTED

Researchers can use many different indexing systems for publications and new tools are on the way even though the organization of an overall system remains on standby. There is a clear multiplication of analysis tools and types of user behaviour (Incites, Research gate, Google Scholar Citations etc.) along with encouragement to use author identifiers. Other alternatives to historic indicators like the Impact Factor are appearing and being made available internationally (cf. the Altmetrics movement cited early).

Charters for publication signatures and incitation measures have been implemented in universities to facilitate identification and enhance visibility and world rankings.

The CNRS possesses the right know-how (SAPPS) in indexing and analysing publications (SAPPS).

40 http://en.wikipedia.org/wiki/Altmetrics
THE WAY TOWARDS TRACEABILITY FOR STI

- Clarify and optimize systems for listing publications used by the CNRS
- Evaluate tools for analysing publications
- Analyse usage of the new tools provided for researchers
- Carry out a national-level study of "common minimum responsibilities" with a view to providing a homogenous presentation of publication identifiers.
DIRECTION 8: AN OVERALL STRATEGY FOR OPEN ACCESS TO PUBLIC SCIENCE

The move towards open access to research results and benefits is a long journey but several major stages have been attained and this is continuing on a daily basis. This has been the single most important issue for the international research community and its decision-makers so far this century.

Overall the stakes are considerable concerning how the benefits of research are shared and what the conditions for the production of science will be. Currently this is hampered by the many tolls imposed by companies which control the various stages of publication in many disciplines.

Henceforth there is a clear consensus in favour and implementation difficulties are appearing. Thanks to the efforts of Open Access pioneers - and this clearly includes the CNRS - debate on this matter has moved on from questions of principle to how the system can work. Defining and implementing the Open Access system is therefore a central strategic question and the potential applications of this system can be seen throughout the whole STI process.

THE PAST

By signing the Berlin Declaration ten years ago, the CNRS made a commitment to open access to publicly funded research results and this commitment was reiterated in the "Position statements" which were part of ScienceEurope 2013. Similarly the Recommendation to European Commission member states in 2012 was of great importance like the aforementioned ministerial statement in 2013 and the G8 guidelines.

In the last ten years there have been many declarations and initiatives along with the appearance of many new open archives and Open Access journals. The INIST has set up a very complete tool "Open access to Scientific and Technical Information" to monitor the movement as a whole. Since its creation the CCSD has always run Open Access communication, training and promotional initiatives for the professional and scientific communities.

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43 http://www.enseignementsup-recherche.gouv.fr/cid66992/discours-de-genevieve-fioraso-lors-des-5e-journees-open-access.html
44 http://openaccess.inist.fr/?Le-G8-donne-sa-position-sur-le
45 http://openaccess.inist.fr/
THE PRESENT

1. Worldwide convergence

Open Access, like research itself, is a global question which is dealt with on many international levels (Science Europe, Global Research Council, Knowledge Exchange COAR46 etc.), at the European level and nationally by the BSN (Digital Scientific Library) research infrastructure for documents. Going forward from the stage of declarations and commitments, an ever-increasing number of institutions (funding agencies, universities, organizations and government bodies) are defining and implementing true open access policies to the extent that the movement towards open access now appears irreversible.

2. Uncertainty about the business model

While there is general agreement in principle, there are still differences of opinion regarding matters like whether to favour the self-archiving model (green route) and the model involving publication in "Open Access” journals (gold route).

In reality, there are three systems rather than the two which are generally put forward (green and gold routes):

- Open archives, green route
- Gold route with publication fees paid by authors or their institution (APCs, "article processing charges")
- Gold route with no costs, new forms of publishing.

3. A degree of confusion reflecting the richness of debate

Too often depositing a bibliographic record in an archive is mixed up with Open Access. Those who are satisfied with existing portals may be under the illusion that Open Access is already a reality whereas in fact they forget that someone has had to pay for journal subscriptions on their behalf. Other worries have been put forward concerning the danger of industrial and commercial property rights being overturned and ignored because of Open Access whereas all that is involved is publication in the same way as in subscription-based journals. Successful lobbying by the major private sector publishers has led to a situation wherein the gold route, and even Open Access itself, is nearly always mistaken for payment by
the author. There is concern about predatory journals which offer hardly any services while claiming to evaluate the quality of articles. Too often, evaluation authorities base their judgement on a journal's reputation (see the impact factor) which can have a dissuasive effect for Open Access.

4. Generic risks

Several levels of risk need to be taken into account for a strategic analysis of national decisions aimed at promoting Open Access particularly matters linked to:

- The long-term preservation of archives,
- The proliferation of publications,
- The weakened position of "academic" publishers,
- A general decrease in quality levels.

These four risks apply to digital STI in general and not specifically to Open Access but Open Access inevitably makes them more likely to occur.

5. Complex positioning but "work in progress"

Uncertainty remains about the way the three routes of Open Access will evolve and it is therefore relevant to sum the situation up.

- "Open Archives, Green route"

Institutional archives (including the HAL platform and all its forms) currently provide relatively few tools for researchers carrying out their work. Today only the theme-based archives act as tools for researchers and these are aimed at the different "communities" (arrive, Repel, PMC etc.) without being limited on an institutional or territorial basis. Apart from certain disciplines (maths, high energy or theoretical physics or a few others etc.) pre-prints are not taken into consideration, only approved scientific production (mainly articles). In some communities, researchers consider they have other things to do than depositing their publications in an archive especially if the work has already been deposited elsewhere (particularly disciplinary archives). So, the default setting of this policy is that it is "lacking in workforce".

Thus fundamentally, the open archives movement now seems unstoppable even though its supporters may get frustrated by the slowness of the change. Even though progress is encouraging, there are still too few deposits on HAL and some still feel legally insecure despite the example of high energy physicists who have succeeded in constructing arXiv without asking themselves too many questions.
• **Gold route with publication fees**

With the "Open Access "hybrid" gold route, publishers receive extra fees and journals continue to be subscription-based with costs remaining the same. The prices currently set by the publishing world mean that a pure Gold route is hard to achieve as a generalized route for Open Access for organizations which publish a great deal. It is also difficult to evaluate the modes of usage linked to the "author pays" Gold route as represented by the SCOAP³ (IN2P3, National Institute of Nuclear and Particle Physics, and the INP, Institute of Physics) and the European Geosciences Union journals supported by the INSU (National Institute for Earth Sciences and Astronomy).

• **Gold route with no costs, new forms of publishing**

There are projects for new publishing forms some of which are in an advanced or mature state like Open Edition (InSHS, Institute for Humanities and Social Sciences). Other projects are just getting underway like episciences.org with its "epi-journals" in maths and computing or for example the new evaluation methods of the "open peer review" type. Joint publishing with research data is also developing as is the publication of data itself in "data journals".

"Mega-journals" are currently seen as being "pure gold route" but are nonetheless original initiatives liable to have important and profound effects on the academic publishing landscape. These are no longer really journals as such - more kinds of pay open archives with certified contents.

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**A STRATEGY FOR THE FUTURE**

The future depends on a set of strategic observations which can be summed up as follows:

- A CNRS strategy on these themes must be multi-stakeholder and constructed with the French universities and research organizations.
- The future needs to be seen in the context of an international vision in liaison with existing networks or those still to be set up.
- There is no universal solution. Those involved need to remain open to all initiatives and experiments when these are shared and reasonable in nature. These may include new forms of publication or communication, new forms of publishing (new "work flows", new business models, "going beyond the green and gold routes").
- Attention needs to be paid to academic publishers and publically funded scientific publishing particularly in maths and in HSS.
1. A general demand from the institutes and STI components

There is a general demand for reference points on certain subjects. Who should data be shared with? What ethical rules can be applied to data conservation and disclosure? What should attitudes be towards publication based on shared data? These questions are all seen as deriving from an application of Open Science and depend both on any given institution’s policy and on a more overall policy on sharing STI in the digital era, as the INSU (National Institute for Earth Sciences and Astronomy) has pointed out.

The InSHS (Institute for Humanities and Social Sciences) highlights the urgent importance of providing an ethical framework for any work on personal data or data relative to opinions or preferences. The Humanities and Social Sciences themselves can contribute to the construction of such references. Widespread, multidisciplinary study is going on. The Huma-Num TGIR (Very Large-Scale Research Infrastructure) has implemented an internal ethical approach to ethnological and sociological data. How should the question of traces left by researchers working with information systems be dealt with? The Cleo underlines the fact that ethical choices cannot be dealt with on a unilateral basis and that these need to be debated. The obligation to reveal data should become the rule so that scientific work may be reproduced and "challenged" if necessary. The INIST (Institute for Scientific and Technical Information) has also expressed a demand along those lines. RENATIS has indicated that it possesses a Code of Ethics written by professionals from the networks (2004-2005) which needs to be updated, disseminated and promoted with STI professionals and brought to the knowledge of the Institutes' and laboratories' management along with researchers.

The INSB (Institute of Biological Sciences) has been working on this question for some time now, using laboratory notebooks to ensure controlled traceability of data and results and also publication. The INSB has an Ethical Committee which makes sure that regulations are respected on genetically modified organisms, human tissues, testing on animals including non-human primates and any tests on humans. Their experience could perhaps be usefully shared with the other Institutes.

The SOLEIL TGIR (Very Large-Scale Research Infrastructure) considers that "we are caught between two stools" in a highly complex environment in which initiatives are implemented at the European level but with varied and sometimes contradictory demands. There are industrial stakeholders (supply of data to be stocked on a long-term basis) who
require a framework to be provided for public responsibilities. At what point and how should the data obtained become public? SOLEIL's questions are "geological" - technical and legal questions need to respond to rules both within France and in Europe as a whole. An "Ethical" Charter appears an interesting idea particularly regarding plagiarism and erroneous data.

The IN2P3 (National Institute of Nuclear and Particle Physics) has not reported any difficulties for access to its data which is mostly illegible outside the context where it is stored.

The INSIS (Institute for Engineering and Systems Sciences) considers that guidelines are required for experiments in the field of virtual reality as is the case for experiments in life sciences.

The INC (Institute of Chemistry) stresses that rules need to be implemented at the right level and that the prime objective needs to be getting support for those rules. What status should be given to "raw" or "interpreted" data? Where does the border between these lie? The question needs to be asked regarding the characterisation of samples and the effect analysis tools may have on these....

Which ethical criteria should guide choices on making publically funded data available? The INEE (Institute of Ecology and Environment) pointed out that the dividing line is hard to establish. Research may be carried out under contracts whose clauses may expressly forbid results and/or data being made available and therefore which criteria should be applied for Open Access to results from publically-funded research?

Access to data with information on people's private lives also brings up moral questions as the INS2I (Institute for Information Sciences and Technologies) has pointed out. Allistene, the Alliance of digital sciences and technologies set up an ethical committee a year ago (http://www.inria.fr/actualite/actualites-inria/ethique-technologies-numeriques) with Max Dauchet as president and the participation of Michele Leduc from the CNRS Ethics Committee. Among other questions, this committee is required to take decisions on the use of research data.

The INSU (National Institute for Earth Sciences and Astronomy), especially in astronomy, has a very positive experience of providing Open Access to data after a proprietary period - often a year - which allows researchers who obtain an observation period after a call for tender to study the data before it is made available to everyone.

This question needs to be managed systemically because those working on data may be able to extract information which in turn characterizes individuals. The order of identity is therefore completely disrupted and moves from data to individuals. Digital identity can be constructed as a result rather than as data such as a birth certificate.

INSMI (National Institute for Mathematical Sciences) recommends that there should be an STI charter based on work done within the Alliances, the INRA (National Institute for Agricultural Research) and by the Ethical Committee. The circulation of information and knowledge sharing are becoming the rule. Researchers' independence needs to be as-
serted as does the principle of refusing to pay for access to results (a reservation in principle about "Article Processing Charges"). Which set of ethics should govern major repositories of public data like Hal and arXiv? How should authorship and ownership of data put onto those repositories be defined and implemented? In fact broader rules than Open Access are required. Do we need to define a wider scope - Open Science?

ETALAB\(^\text{47}\), the public data website (see the French Prime Minister's circular dated September 17th 2013) will require us to provide an overall reply to these questions on the communication of public research data.

2. An ethical charter

An Ethical Charter is required on several levels:

- Study is needed into the principles required to underpin digital STI,
- These principles need to be applied according to the STI objects concerned (data, publications) and fields of application,
- We need to examine requirements for specific STI Charters for each research field or project with a view to contributing to the public ETALAB system,
- We need to take from existing practices in France (Alliances, Research organizations) and internationally (Europe, major research organizations in other countries etc.).

### DIGITAL RIGHTS AS APPLIED TO STI

1. The institutes' requirements

On this subject too, there is a fairly generalized demand for clarification

The INEE (Institute of Ecology and Environment) stresses the need for a shared study and explanation of the legal situation which would correspond to researchers' requirements and provide a structured tool for all. This should be based on practices and the Unit Directors' questions. This request needs to be included in the action principles of the "Orientation Plan".

The InSHS (Institute for Humanities and Social Sciences) considers that robust legal support is necessary and should be the role of the CNRS Legal Affairs department.

Guidelines on best practices and recommendations on Open Access and research data

\(^\text{47}\) This idea has already had an effect - the Australian National Data Service has begun circulating research data and societal data and creating a synergy between the two.
should be provided along with help for researchers who negotiate with publishers (publishing contract model for journals; rights assignment contract model including reference to Open Access). Legal assistance is also required for laboratories which create digital tools. The InSHS also has major requirements in legal aspects and in the anonymization of data.

The Persée UMS (Joint service unit) works with documents covered by author’s copyright as well as corpora which are not and therefore stresses that legal aspects are central to their work. They need to know who the rights holders are and which rights they hold to their documents as well as how to run rights assignments and provide for successful Open Access dissemination.

The researchers require accurate advice and guidelines on matters related to digital identity. Should training be provided or would specific tools or use of the social networks be preferable? Institutions have an essential role to play in laying the foundations for the production and sharing of digital STI.

The INSIS (Institute for Engineering and Systems Sciences) put forward a more basic requirement namely to know which publishing rights are applicable. The DIST (Scientific and Technical Information Department) supports the principle of European-level guidelines for access to these tools.

Various different subjects need to be dealt with in collaboration with the College de l’Edition publique (Public Publishing Board, BSN 7) namely the legal environment for document supply, exploitation rights for corpora and managing access for rights holders. The INIST (Institute for Scientific and Technical Information) insists on the need to clarify the web of data and implement common rules for STI producers and users. The CCSD (Centre for Direct Scientific Communication) also observed that clarification is needed regarding the rights applicable to public research deposits, the conservation of archives and public value-added services.

2. Legal norms and advice regarding digital STI rights

Several complementary elements are required along with norms being defined and implemented. These are:

- A masterplan on digital rights based on a set of specifications (cahier des charges) defined according to the Institutes’ researchers’ requirements,
- The definition of the basis for a call for offers with a view to international legal consultation covering basic requirements,
- An advice "hotline" service.

The DIST (Scientific and Technical Information Department) reiterates the fact that we need to stabilize the public framework for services providing access to and sharing of
publically-funded scientific research results. And yet similar services are available in the private sector. This means there could be a conflict between the concepts of public service and free enterprise and industry. The legal framework for public sector participations needs to be stabilized to enable the provision of “Open Process” services which are necessary to the promotion of publically-funded research results.

THE SECURITY RULES WHICH APPLY TO DATA AND PUBLICATIONS

Work needs to be done on security rules applying to STI results and particularly to sensitive or confidential results. This would be independent of work on rules on long-term conservation and archiving discussed earlier in this document.

1. Demand from the Institutes

The TGIRs (Very large-scale research infrastructures) have expressed this demand. SOLEIL reported on practices set up for the TGIR and expressed willingness to get involved in work on providing feedback on experience and sharing best practices. Huma-Num also stressed the importance of this concern and the arrangements made to develop an action plan on both infrastructure and data security. The INS2I (Institute for Information Sciences and Technologies) expressed a demand from the whole organization for work to be done on fighting intrusion or data extraction and for a systematic action plan to ensure secure storage and preservation of France's scientific and intellectual heritage.

The INEE (Institute of Ecology and Environment) considers that security should not be seen as "STI work" but as necessary condition for that work to be carried out.

2. The requirement for an overall masterplan for STI security

This requirement requires the following to be implemented:

- An overall security masterplan covering STI access, conservation and dissemination,
- Exchanges of best practices
- Solutions defined in collaboration with the BSN (Digital Scientific Library) need to be shared.

GOVERNANCE AND STEERING FOR STI ACTION
Two types of questions were discussed during work on the Strategic Orientation Plan:

- Technical governance of CNRS STI projects,
- STI support for the Institutes' scientific steering

1. Governance of CNRS STI projects

Modalities for the governance of STI projects differ greatly from one research community to another. Governance needs to be based on the potential service provided by the "IT specialist, document specialist, researcher" trio with variations according to the community involved.

The Institutes want clearly understandable and efficient organization of the whole STI sector by the DIST (Scientific and Technical Information Department). The idea of an STI "Regulation Committee" at the DIST has been suggested to drive work on the various STI projects and set up a stakeholder network.

The INIST (Institute for Scientific and Technical Information) intends to take its rightful place on the CNRS STI Regulation Committee which will enable projects to be shared between the DIST and the STI units and the implementation of regular reporting on work being steered. This committee will enable it to develop networked links with other operators. For example Huma-Num observed that work on defining objectives for a given project needs to be given formal status. The RENATIS Network expressed a similar viewpoint and is ready to be part of the STI Regulation Committee.

- Set up an STI Regulation Committee integrated into the DIST. This Tripartite Committee (Institutes, Specialist STI Units, INIST in particular, Networks of STI personnel) would be asked to coordinate the development of CNRS STI projects.

2. STI support for the Institutes' scientific steering

Bibliometric indicators (divided according to the institute concerned, interdisciplinary links, national or regional percentages, international collaborations etc.) are produced by the SAPPS (Supporting Service for Scientific Prospective & Policy) and are widely used. However the institutes do not always have an overall vision of their scientific production (this was pointed out by the INC - Institute of Chemistry - for example) and would appreciate optimized, shared bibliographic management tools being made available.

In this area certain institutes (INSB - Institute of Biological Sciences - for example) expressed a demand for a more targeted exploitation of the base derived from the WOS through tracking CNRS units in affiliations. Other complementary methods are required in cases where existing metrics do not appear to give France its rightful ranking among the
corresponding scientific communities. This was the case of the IN2P3 (*National Institute of Nuclear and Particle Physics*) which considers that its ranking in CERN publications needs to be brought out better. Currently, work on analysing publications on the WOS is being carried out by several Institutes (INEE, INP particularly) to obtain more information on the units' work or to detect collaborations between units.

For example the INSB expressed a desire to promote its research work better by differentiating it from the work of other French or European research organizations working in the same field. The IN2P3 suggested that thought is required on new bibliometric indicators and would be ready to participate to a large degree in a project involving evaluation, the quality of STI, differentiated forms of presentation of STI results (lab notebooks in particular) and sharing excellence.

- Provide a range of services for analysis of the Institutes' publications to assist the governance of scientific projects (monitoring collaborations and research themes),

- Share these tools with the CNRS's partners to develop common approaches and collaborations.
THE DIGITAL STI INITIATIVE: A FOURTH CORNERSTONE?

Does data "make" science as the movement for a "Fourth Cornerstone" (Quatrième Pilier) of science suggests? Or does science have complex digital foundations as the CNRS suggested in its Contribution to the National Research Strategy? This question merits constructed and shared study which could be driven by work carried out internally at the CNRS (the ISCC - Institute of Communication Sciences - in particular).

- Organize a conference with CNRS partners and well-constructed study of STI in the digital era.

RESEARCH INTO STI

Internal study linked to the Plan has provided a preliminary view of the approaches of one or more disciplines when faced with the necessity of defining new research objects which define new conditions for research results prior to the production of STI. The INSMI (National Institute for Mathematical Sciences) observed that research into the heterogeneity of objects and data is an essential theme.

One of INIST's missions is to provide access to scientific and technical information and indeed to scientific production as a whole which requires being able to exploit the information therein. In this context, the quality and wealth of associated metadata is of course essential but direct exploitation of all knowledge in primary texts is also necessary, as the expectations of the community regarding the ISTEX project's added services show. The INIST (Institute for Scientific and Technical Information) is also involved in research and future investment projects involving a great deal of text mining with a view to providing an elaborated access to scientific knowledge described in the publications INIST provides for the community.

At the InSHS (Institute for Humanities and Social Sciences) the creation of a Multidisciplinary Theme-Based Network has been suggested for the digital humanities. The idea behind this network would be to regularly set up meetings between key stakeholders in the Digital Humanities (Cleo or Huma-Num along with researchers from laboratories) to better analyze contributions made by the Digital Humanities and the requirements these generate in turn to create a link between key players and the Institute.
Research into STI in the Pôle Lorrain (University of Lorraine, LORIA, ATILF etc.) at INIST will provide support for STI projects at the CNRS and throughout Higher Education and Research. Economic and social development and promotion will be the objectives of the projects chosen.

An STI partnership will be developed through setting up a network of research organizations' projects.

Preliminary interdisciplinary work will be developed in partnership with the CNRS Mission for Interdisciplinarity.

**INNOVATION IN STI TOOLS AND APPROACHES**

Above all, innovation is based on the evolution of information systems, databases, archiving systems, Electronic Document Management, linguistic processing, information conceptualization and of knowledge i.e. everything liable to enrich databases and speed up online research. Innovative technologies need to be taken up to optimize the processing of or access to information.

The INC (Institute of Chemistry) observed that researchers' publications become known if they are in indexed journals like "Nature" etc. However there are no mechanisms, tools or systems to provide visibility for publications which are not indexed on the major systems. Most researchers are concerned by their own visibility and tend to gather their publications using researcher ID and google and therefore this would also be worth promoting. Research Gate and Orcid are becoming increasingly important. At the INRIA (National Institute for Research in Computer Science and Control) teams are working on knowledge engineering. This question is linked to the promotion of publications but moving forward from that the INC (Institute of Chemistry) has developed an approach for exploring corpora of knowledge related to one or more research subjects (molecules, reactions etc.) and is studying STI tools which can be used to explore new fields of data and publications. Other disciplines are also working on data interoperability which is important for uploading data to networks and integrating it. This requires international agreements and in this area it is useful to cite projects like the European Virtual Astronomical Observatory and the work begun by the Research Data Alliance which has just been set up by the European Commission, the NSF and Australia

The CCSD considers that one of the most important factors to drive innovation is to turn HAL into a central tool for data integration which would go further than the services it provides a scientific communication tool. The aim would be for users to be able to link all research materials to their publications. For partner institutions, HAL must become the tool providing interoperability between the databases and reference systems which are useful for the various different aspects of research management.
There is therefore a clear necessity for new categories of STI analysis tools and particularly a demand for tools with search fields which are much more open to "intelligent" semantic categories (analysis of preferences or opinions…. on a research field's STI). This demand varies according to the community concerned. For example many of the physics communities are large enough and work with sufficiently homogeneous STI to not require tracking on STI which is being constructed. This community's requirements seem to be satisfied by Research Gate but it nonetheless considers that it would be an interesting development if Hal and arXiv were equipped with tools permitting the extraction of articles using pre-provided keywords or if their users could subscribe to themes or sub-themes. Basically this amounts to twinning Open Access with "Open Process".

Without exception, the scientific communities who took part in the study of the future of STI are open to the idea of an overall approach, would like the existing tools to be better known and shared and want emerging tools to be accessible for all researchers. This last question covers the whole idea of access to state-of-the-art STI innovation and dovetails with the question of monitoring and evaluation included in the question of monitoring and evaluation included in the CNRS STI Strategic Orientation Plan's first principle.

- Make an inventory and define the typology of STI analysis tools,
- Make known and share best practices,
- Monitor likely changes in the medium-term and prepare for their dissemination.
PART 2
SHARED ACTIONS *

* This section refers to PAPs ("Plan d'Actions Partagés") or Shared Action Plans
盖 PAP 1

OBTAINING INFORMATION

- Covering the field of STI resources for researchers and the common and more specific features of such resources.

**National project leader:**
Raymond BERARD
Director of the INIST
(Institute for Scientific and Technical Information)
RETHINKING THE ARCHITECTURE AND SCOPE OF STI ACCESS PORTALS

DEVELOPING ANALYSIS OF CHOICES AND SPENDING

PROVIDING SUPPORT FOR INSTITUTIONS’ LICENSING NEGOTIATIONS AND PURCHASING STRATEGIES

SUPPORTING CNRS UNITS’ LOCAL LICENSING NEGOTIATIONS

ACCOMPANYING AND SUPPORTING CHANGES TO THE PRIMARY DOCUMENT SUPPLY SYSTEM

DEVELOPMENT AND IMPLEMENTATION OF CONSULTANCY SUPPORT FOR LICENSING NEGOTIATIONS

BUILDING A COHERENT NATIONAL INTERDISCIPLINARY PROGRAMME FOR THE PRESERVATION OF FRENCH SCIENTIFIC HERITAGE WHICH INCLUDES LONG-TERM ARCHIVING
RETHINKING THE ARCHITECTURE AND SCOPE OF STI ACCESS PORTALS

CONTACT:

Laurent SCHMITT
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OBJECTIVES:
The aim of this project is to respond to researchers’ new requirements (Google Scholar-type searches, mobile access etc.) and integrate the current movement for access to national digital resources (ISTEX, HAL, Persée, Revues.org, etc.). To achieve this, the architecture and scope of CNSR STI access portals needs to be rethought to enable communities of CNRS laboratory researchers to access all document resources whether access is negotiated or open. This involves modernizing document consultation and search functions, optimizing the visibility of and access to resources, facilitating individual authentication and developing the interoperability of resources).

EXPECTED RESULTS:

- A report giving a summary of the different scenarios considered and their likely impact on the organization and implementation difficulties.
  - **Short and medium-term:** Take stock of the current situation – Scenarios – Means

The aim is to plan the implementation of a national infrastructure taking into account all the following aspects:

- On the political level: where does funding come from (B11) and how is it divided up between the institutes? Who manages the funding? Which authority takes decisions on this? How does interdisciplinarity work in this landscape?
- On the organizational level: rethink the roles and missions of those involved (DIST, CORIST, INIST)? For each role, define who is the ordering institution, who is the operator and which is the target community?
- On the technical level: should new portals be constructed on a stand-alone basis or dedicated to individual institutes? Which tools need to be implemented for
which usages? How should portals be integrated with existing or upcoming tools (ENT, ISTEX)?

- **Long-term**: The creation of a shared interoperable interdisciplinary infrastructure which will enable researchers to get quick anywhere/ anytime access to all negotiated or Open Access resources.

**LINKS WITH BSN TASK-FORCES:**
- BSN 1 – BSN 2 - BSN 3

**MEANS AND INFRASTRUCTURES ALREADY INVOLVED AND AVAILABLE:**
- A survey of technical requirements has already been run internally at the INIST,
- Existing portals: BiblioVie, BiblioSHS, etc.

**EXTRA MEANS REQUIRED:**
- HR (2 people full time) for the development of phase 2
- Budget to be defined in phase 1 according to the expected requirements and functionalities.

**RESOURCES:**
- People involved:
  - C. FOURNIER (Licensing and Digital Resources Manager, INIST)
  - D. DARDAINE (Portals and Statistics Supervisor, INIST)
  - All the STI correspondents (“Corists”) and their deputies

- Means (infrastructures):
  - Mission Budget (~ 2000 euros) for the first phase.

**LINKED ACTIONS:**
- ISTEX project, PANIST, National Licences

**OTHER PARTICIPANTS INVOLVED:**
- University SCDs (Joint Documentation Services), EPSTs (Public Scientific and Technological Institutions)
DEVELOPING ANALYSIS OF CHOICES AND SPENDING

CONTACT:
Christine WEIL-MIKO
action12@services.cnrs.fr

OBJECTIVE:
To optimize both decision-making regarding acquisitions of digital resources and sources of funding based on in-depth knowledge of research communities' requirements.

EXPECTED RESULTS:
Improve the service provided for researchers while:
• Optimizing the costs of CNRS purchases at the local scale
• Providing information on the comparative cost/benefit ratio for local purchases and for the move towards centralized CNRS or national licensing negotiations in partnership with Couperin.org
• Cut the costs of duplicate supply to the CNRS and other establishments
• Stop unnecessary duplicate purchases (local purchasing / digital access via the portals)
• Provide national-level mapping of purchases and accesses to identify "duplicate supply" and move towards a national digital acquisitions policy (in partnership with Couperin.org and the MISTRD - Department of Scientific and Technical Information and the Documentation Network)

LINKS WITH BSN TASK-FORCES:
• BSN 1

RESOURCES:
• People involved
  C. CHAMBELLAN (S. PERINAL)
  R. BERARD
• Institutes
• DIST (Scientific and Technical Information Department)
• INIST ( Institute for Scientific and Technical Information)
• DSFIM (Financial Strategy, Real Estate and Modernization Department)
• DDAI (CNRS Purchasing and Innovation Office)
LINKED ACTIONS:
• Find out about researchers’ digital resource requirements
• Analyze the reasons for local purchases (print archives, lack of knowledge of existing resources etc.)
• DIST/DSFIM/DDAI:
  • Update the 2011 budget analysis
  • DIST/DSFIM/Couperin.org
  • Identify local CNRS contributions in universities
CONTACT:
Christine WEIL-MIKO
action13@services.cnrs.fr

OBJECTIVE:
To optimize spending on digital resources to provide a better service.

LINKS WITH BSN TASK-FORCES:
BSN 1, BSN 2

EXPECTED RESULTS:
Improve the service provided for researchers while:

- Optimizing the costs of buying digital resources and provide access to resources which comply with the requirements of each institute
- Economic aspects: Study of the costs of the different methods possible:
  - Local purchases
  - Centralized licensing negotiation at each organization (grouped purchases)
  - National licensing negotiation with Couperin.org (including grouped orders)
- Technical aspects: Changes in access management which enable licensing negotiations to be more closely adapted to requirements
- Political aspects: The evolution towards a national document resources policy led by the establishments, the MISTRD (Department Of Scientific and Technical Information and The Documentation Network), Couperin.org and ABES (Bibliographic Agency For Higher Education) within the framework of BSN 1

RESOURCES:
DIST (Scientific and Technical Information Department)
Institutes
INIST (Institute for Scientific and Technical Information)
DSFIM (Financial Strategy, Real Estate and Modernization Department)
DDAI (CNRS Purchasing and Innovation Office)
MEANS AND INFRASTRUCTURES ALREADY INVOLVED AND AVAILABLE:

- INIST resources - 6/7 people with experience of working with and contacts at many publishers (50 publishers, 70 groups of journals, e-books and databases)

EXTRA MEANS REQUIRED:

Extra people are required for cost analysis and licensing negotiations within the establishment and/or Couperin.org
Technical and budgetary resources are required to adapt portals to the specific requirements of each Institute.

LINKED ACTIONS:

- Find out about researchers' digital resource requirements
- DIST / DSFIM / DDAI:
- Update the 2011 budget analysis
- DIST/DSFIM/Couperin.org
- Identify local CNRS contributions in universities
- INIST/CNRS / Renater
- Study the ways of controlling access to digital resources according to establishments' or individuals' rights

OTHER PARTICIPANTS INVOLVED:

- MISTRD (Department Of Scientific and Technical Information and The Documentation Network), Couperin.org
SUPPORTING CNRS UNITS' LOCAL LICENSING NEGOTIATIONS

CONTACT:
Christine WEIL-MIKO
action14@services.cnrs.fr

OBJECTIVE:
To improve the purchasing structure and system to optimize spending which is currently carried out locally without prior consultation.

EXPECTED RESULTS:
Improve knowledge of local spending to optimising it by one or more of the following:

- Reducing duplicate purchases by working with centralized digital resources
- Grouping purchases in licensing negotiations at an establishment or nationally with Couperin.org
- Optimizing the use of discounts negotiated for print in national negotiations
- DIST/INIST/DSFIM/DDAI:
  Update the 2011 budget analysis
- DIST/Institutes
  Analysis of the reasons for local purchases at each institute (print archiving to complete collections or for security reasons, lack of knowledge of existing resources, historically linked with national negotiations in the case of spending from university budgets, etc.)

LINKS WITH BSN TASK-FORCES:
BSN 1 for acquisitions, BSN 6 for preservation

MEANS AND INFRASTRUCTURES ALREADY INVOLVED AND AVAILABLE:
INIST resources - 6/7 people with experience of working with and contacts at many publishers and experience in file analysis.

EXTRA MEANS REQUIRED:
Collaborative study with the MISTRD (Department Of Scientific and Technical Information and The Documentation Network) as part of a national print preservation plan (CADIST, CTLes)
Collaborative study with the DDAI (*CNRS Purchasing and Innovation Office*) into the possible mutualisation of the national Ebsco and INIST markets.

**RESOURCES:**
Institutes
DSFIM (*Financial Strategy, Real Estate and Modernization Department*)
DDAI (*CNRS Purchasing and Innovation Office*)

**LINKED ACTIONS:**
Communication work (Unit Directors / STI professionals STI / administrators) including a study of the creation of an STI site for STI researchers and professionals.

**OTHER PARTICIPANTS INVOLVED:**
Couperin.org, ABES (*Bibliographic Agency For Higher Education*)
ACCOMPANYING AND SUPPORTING CHANGES TO THE PRIMARY DOCUMENT SUPPLY SYSTEM

CONTACT
Jacqueline GILLET
action15@services.cnrs.fr

OBJECTIVE:
- To modernize the national academic document supply system by bringing together and harmonizing existing tools and structures, Refdoc (INIST) and Sudoc (ABES).
- Re-evaluate the user scope for this academic service (refocusing on Higher Education and Research?)
- Develop the integration of Open Access documents

EXPECTED RESULTS:
- Feasibility of the integration of metadata from other catalogues like Sudoc’s or the catalogues of certain Centres for the Acquisition and Dissemination of Scientific and Technical Information (Cadists) on an experimental basis.
- Develop the integration of institutional resources in Open Access.
- The enrichment of Refdoc by the physical integration of this metadata

LINKS WITH BSN TASK-FORCES:
BSN 8

MEANS AND INFRASTRUCTURES ALREADY INVOLVED AND AVAILABLE:
- First phase of integration of open access resources in November 2013 (Hal, Persée, revues.org). Second phase is planned for 2014.
- First impact studies on tightening focus on Higher Education and Research

EXTRA MEANS REQUIRED:
- People: two full-time employees are required in development for the integration of metadata and in legal upgrading for digital document supply (evolutive maintenance) and diverse corrective maintenance work which has been on standby for a year.
RESOURCES:
- Etienne FLEURET, Jacqueline GILLET, Jean-Yves MOUGEL
- Experts from the BSN 8 segment, particularly the ABES (*Bibliographic Agency For Higher Education*)
- Centres for the Acquisition and Dissemination of Scientific and Technical Information (Cadists)

Means (infrastructures): Work with existing platforms (Refdoc and Sudoc).

OTHER PARTICIPANTS INVOLVED:
- ABES, CCSD, Persée, Revues.org, Cadists
DEVELOPMENT AND IMPLEMENTATION OF CONSULTANCY SUPPORT FOR LICENSING NEGOTIATIONS

CONTACT:
Etienne FLEURET
action16@services.cnrs.fr

OBJECTIVE:

- To optimize licensing negotiations for digital resources to obtain the best conditions possible from supplies.

INIST has nearly 10 years experience in licensing negotiations for digital resources both in theme-based negotiations (for portals) and in national negotiations (alongside COUPERIN, the Public Scientific and Technological Institutions and ABES) where INIST represents the CNRS. Each year there are such negotiations with over 50 publishers (70 groups of journals or databases) aimed at obtaining price discounts, long-term access and user statistics.

Because of this, the INIST can provide:

- Study and consulting services to the Institutes based on researchers' requirements. The InSHS (Institute for Humanities and Social Sciences) would like a service which corresponds with its requirements as closely as possible, the INSIS (Institute for Engineering and Systems Sciences) has not expressed any requirements (except the IEEE) and the IN2P3 (Institute of Nuclear and Particle Physics) has no identified requirements.

- A study of the cost and the different possible systems

- Analysis of how portals or the portal system is evolving in collaboration with the DIST/DSFIM/DDAI and COUPERIN. This would involve eliminating internal duplicates at the CNRS, finding opportunities for grouped orders, communication work to inform the laboratories of the existing possibilities and how these are evolving and finally a reduction of double supply with universities.

EXPECTED RESULTS:

- Rethink the decision-making organization
- Optimize costs
- Enhance usage measurement
- Promote and develop interdisciplinarity, share costs
- Communicate better with users
LINKS WITH BSN TASK-FORCES:

- BSN 1

RESOURCES:

- DIST (Scientific and Technical Information Department)
- INIST (Institute for Scientific and Technical Information)
- Institutes
- Close links with Couperin

MEDIUM AND LONG-TERM

- Run qualitative surveys
- Set up acquisitions committees made up of STI specialists and researchers from different fields
- Set up discovery campaigns / initiatives for new resources
- Suggest and track user requests
- Present and communicate on subscription campaign reports
BUILDING A COHERENT NATIONAL INTERDISCIPLINARY PROGRAMME FOR THE PRESERVATION OF FRENCH SCIENTIFIC HERITAGE WHICH INCLUDES LONG-TERM ARCHIVING

CONTACT:
Paolo LAÏ
action17@services.cnrs.fr

OBJECTIVE:
Several scientific disciplines have stressed the importance of older archives as necessary for the development of science being constructed now. The objective is to construct a coherent national interdisciplinary programme for the preservation of French scientific heritage which includes long-term archiving (in liaison with BSN 5 and BSN 6).

LINKS WITH BSN TASK-FORCES:
BSN 5 and BSN 6

RESOURCES:
- People involved → NumDam, Persée, INIST
- Means (infrastructures) →

EXPECTED RESULTS:
- To identify stakeholders and participants of the preservation programme
- To define a preservation policy
- To make publications available for the scientific community because they are necessary for the development of science being constructed now.
- Synergy, making a local action project more widespread
PAP 2: PUBLISHING

- Providing explicit solutions for Open Access and for all publication routes as defined by the scientific communities

**National project leader:**
Christoph SORGER

*Director of the INSMI (National Institute for Mathematical Sciences)*
DEVELOPING SERVICES TO SUPPORT OPEN ACCESS ("OPEN PROCESS")

CONTACT:

Christine BERTHAUD

A person from the RENATIS network (document specialist who uploads publications onto HAL)

INRIA

action21@services.cnrs.fr

OBJECTIVE:

- To reach the best level of coverage possible for CNRS units' Open Access publications: services to assist deposits from all possible sources possibly provided by third party professionals
- Implement a policy or policies for the Gold "pay" route (+communication)
- Steer and support existing programmes or those being set up (HAL, Lara, Cleo, Persée, Cedram, I-Revues, Episciences)

EXPECTED RESULTS:

- Value-added services which comply with the above objectives

LINKS WITH BSN TASK-FORCES:

- BSN 4, BSN 3 (Conditor), BSN 7

RESOURCES:

- INIST (Institute for Scientific and Technical Information), document specialists, HAL, HAL's CST
- INRIA (National Institute for Research in Computer Science and Control)
DEFINING THE RULES FOR DEPOSITS IN THE HAL OPEN ARCHIVES

CONTACT:

Christine BERTHAUD  
action22@services.cnrs.fr

OBJECTIVE:

- To reach the best level of coverage possible for CNRS units' publications

EXPECTED RESULTS:

- To set up an organization to assist with deposits (action 23).
- Objective and date to be determined: Define the objective that CNRS publications should be in HAL by the end of 2015 for example (HAL is currently not entirely in Open Access).

Shared rules with partners with variables according to disciplines. Examples: making it compulsory for researchers, providing support services etc.

LINKS WITH BSN TASK-FORCES:

- BSN 4, BSN 3

RESOURCES:

- Projects will be submitted to the CCSD Scientific and Technical Committee for approval, actions proposed as part of this project
- Unit Directors / researchers who wish to take part
- INRIA (National Institute for Research in Computer Science and Control)
- HAL, document specialists, INIST (contribution to be constructed), HAL CST
ACCOMPANYING ACADEMIC PUBLISHING

CONTACT:
Thierry BOUCHE
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OBJECTIVE:
- Prevent the rapid development of Open Access leading to the disappearance of academic publishers. This would deprive academic societies of resources for action particularly in the humanities and social sciences and in mathematics but also in STM (EDP Sciences, I Revues).
- Make sure there is a smooth transition

EXPECTED RESULTS:
- Services provided by academic publishers which are well adapted to the world of Open Access to literature and follow robust business models.
- The functions of academic societies (grants, conferences etc.) ensured for the long-term.
- Technological, economic and legal support for Open Access scientific publishing.
- High level Open Access scientific publishing (BSN 7 best practices charter).

LINKS WITH BSN TASK-FORCES:
- BSN 4 and BSN 7, BSN 1 (to a lesser degree)

RESOURCES:
- The Institute of Mathematics is setting up a system to share published resources (2014)
- Epi-journals in mathematics (Th Bouche, Openedition, etc.) INIST

LINKED ACTIONS:
All actions linked to Open Access
OTHER PARTICIPANTS INVOLVED:
Scientific publishing establishments and organizations, academic publishers, academic societies.
CONSTRUCTING A PUBLIC PUBLISHING POLICY

CONTACT:
Marin DACOS
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OBJECTIVE:
Implement a public open publishing policy which:
- complies with the objectives on Open Access defined by the Research Ministry and the European Commission,
- strengthens public publishing particularly with regard to its business model and skill set,
- drives editorial innovation.

EXPECTED RESULTS:
• Reinforcement of the mission assigned to the Higher Education and Research Ministry to disseminate research results
• Reinforcement of national and European infrastructures which provide high level digital publishing services
• Implementation of a sustainable business model for Open Access.
• Promote the move from spending on acquisitions of closed resources to open resources.
• Development of editorial innovation (workflows and editorial forms).

LINKS WITH BSN TASK-FORCES:
• BSN 1, BSN 4, BSN 7, BSN 9.

RESOURCES:
• AEDRES (Association of Higher Education and Research Publishers)
• MEDICI Network
• BSN (Digital Scientific Library)
• Persée
• OpenEdition
• I-revues
• DARIAH (Digital Research Infrastructure for the Arts and Humanities)

LINKED ACTIONS:
All actions linked to Open Access
ENHANCING THE VISIBILITY OF PUBLICATIONS AND ELEMENTS OF PUBLICATIONS BY THE CNRS AND ITS PARTNERS

CONTACT:
Anne SIGOGNEAU
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OBJECTIVE:
Establish principles for how affiliations are written in French scientific publications which are coherent with producers of bibliographic databases to enhance the visibility of:
- national laboratories in STI producers' databases to help researchers in their information search practices
- research organizations to which laboratories are associated and thus facilitate international institutional comparisons and the analysis of collaborations within France and abroad.

EXPECTED RESULTS:
- Propose principles for how affiliations are written in scientific publications: February 2014
- Write a set of recommendations for authors: March 2014
- Disseminate this set of recommendations to those involved: as of April-May 2014

LINKS WITH BSN TASK-FORCES:
- BSN 3 (Conditor)

RESOURCES:
- STI correspondents
- DASTR (Department for the Territorial Organization of Research) - SAPPS (Supporting Service for Scientific Prospective &. Policy)
- DIST (Scientific and Technical Information Department)

LINKED ACTIONS:
Analysis of publications by laboratories associated with CNRS institutes and support for the governance of PAP3 projects. Any actions linked to those who "disseminate" scientific publications particularly PAP2 stakeholders
PROVIDING LINGUISTIC SUPPORT TO ENHANCE THE INTERNATIONAL VISIBILITY OF PUBLICATIONS AND ELEMENTS OF PUBLICATIONS BY THE CNRS AND ITS PARTNERS BY TRANSLATING THEIR METADATA

CONTACT:
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OBJECTIVES:
- Enhance the visibility of French scientific publications available on Open Access platforms (HAL, Persée, Open Editions, I-Revues, etc.) by translating their metadata particularly abstracts ("back covers") in other languages, particularly English
- Construct a process by which such documents can be gathered, processed and translated then reintegrated into their original dissemination environment
- Define scientific quality control processes for translations
- Define, identify, calibrate and plan out the human and financial resources required for the project
- Define and list the systems required for implementation.

LINKS WITH BSN TASK-FORCES:
BSN 7, BSN 3 (Conditor)

RESOURCES:
1. HAL, Persée, Open Editions, I-Revues, etc.
2. INIST (Institute for Scientific and Technical Information)
3. Translators

EXPECTED RESULTS:
- Enhance the international visibility of French scientific publications available on Open Access platforms
- Set up a workflow to aliment and update Open Access Platforms
MEDIUM AND LONG-TERM

- Human and financial resources adapted to the volumes of documents to be translated

OTHER PARTICIPANTS INVOLVED:
HAL, Persée, Open Editions, I-REVUES and any publishing organizations.
ENHANCING AND PROMOTING SCIENTIFIC HERITAGE: DIGITIZATION, ARCHIVING AND MULTIMEDIA

CONTACT:
Nathalie FARGIER
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OBJECTIVES:
The objective of this shared project is to set the foundations for a policy to enhance and promote scientific heritage for the benefit of CNRS units:

- to identify those with the right skill sets working in digitization to coordinate digitization work at CNRS level
- to promote innovative use of digitized corpora (display, exploitation, reappropriation)
- to promote the free dissemination of corpora and open formats and standards to guarantee interoperability, reuse and long-term data preservation.
- to promote sharing and reuse of models, concepts and tools implemented by CNRS units
- to work in harmony with BSN 5

The project takes into account the diversity of corpora particularly previously relatively unused sources and archives (textual, iconographic, cartographic, 3D corpora, furniture and buildings, audio and audiovisual material etc.)

EXPECTED RESULTS:

- Take part in defining a concerted national digitization policy with the BSN
- Spreading innovative shared solutions

LINKS WITH BSN TASK-FORCES:
BSN 5, BSN 6

RESOURCES:
- Numdam
- Persée
• INIST
• HumaNum
• SIT Correspondents (Corists) and document specialist networks

**LINKED ACTIONS:**
• Clarifying the legal situation for digital STI

**OTHER PARTICIPANTS INVOLVED:**
• University SCDs (*Joint Documentation Services*)
• Public Scientific and Technological Institutions (EPSTs)
PAP 3

ANALYZING AND PROMOTING INFORMATION

- Accompanying requirements in analysis of data and publications using innovative, shared tools and practices

National project leader:
Bruno DAVID
INEE (Institute of Ecology and Environment)
"Chargé de mission" (Project Officer)
ANALYSIS OF CNRS INSTITUTES' PUBLICATIONS AND SUPPORT FOR GOVERNANCE OF SCIENTIFIC PROJECTS

DEFINING AND IMPLEMENTING AN ORGANIZATIONAL POLICY REGARDING RESEARCH DATA

ASSESSING CURRENT SYSTEMS FOR THE ANALYSIS OF SCIENTIFIC PRODUCTION (DATA, PUBLICATIONS, ETC.)

STIMULATING STI RESEARCH AND INNOVATION

DEVELOPING SCIENTIFIC TERMINOLOGIES

DEVELOPING DOCUMENT SPECIALIST ENGINEERING INVOLVING THE CURATION OF METADATA AND DATA
ANALYSIS OF CNRS INSTITUTES' PUBLICATIONS AND SUPPORT FOR GOVERNANCE OF SCIENTIFIC PROJECTS

CONTACT:
Mathilde DE SAINT-LEGER and Anne-Marie BADOLATO
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OBJECTIVE:
This project has dual objectives:
- To survey CNRS production (contribution to the Conditor project which is the subject of an experiment in the framework of BSN 3)
- Define and provide a set of STI services to analyse scientific documents and publications by the Institutes and CNRS management offices to support the governance of scientific projects:
  - measurement and tracking of collaborations (current indicators, new metrics)
  - inventory of teams and researchers working on given research themes (Thetra project)

EXPECTED RESULTS:
- Short term:
  - Clarification of referencing systems for CNRS units and researchers' publications (March 2014)
  - Framework document setting out the offer of services (requirements, scopes, organization required to be set up)
- MEDIUM AND LONG-TERM
  - Optimization of referencing systems for CNRS units and researchers' publications
  - Provide a package of services and support for the production of current indicators and for the CNRS and its partners
  - Provide a package of services for the analysis of the Institutes' publications to support the governance of scientific projects:

LINKS WITH BSN TASK-FORCES:
- BSN 3 Conditor
RESOURCES:
- INIST (Institute for Scientific and Technical Information)
- SAPPS (Supporting Service for Scientific Prospective & Policy)
- Institutes
- DIST (Scientific and Technical Information Department)
- DIRE (Innovation and Business Relations Department)
DEFINING AND IMPLEMENTING AN ORGANIZATIONAL POLICY REGARDING RESEARCH DATA

CONTACT:
Francis ANDRÉ
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OBJECTIVE:
To implement shared rules and conditions for the promotion of data created in CNRS research projects.

Gaining acceptance for the common conditions for data promotion requires:

- institutional support for the production of a political framing document for the whole organization,
- researchers' individual support which will increase awareness and lead to the definition of "rewarding" rules.

The following are also necessary:

- to run a survey and index databases created at the CNRS (continuing the 2010 survey and making INEE’s experience widespread) to define and provide a package of services,
- to provide the right environment and conditions (training, management plans, data publication, intellectual property rights, ethics),
- set up and/or accompany infrastructures,
- support work on the standardization of descriptions, formats, feeds and access rules.

More involvement is required with international standardization committees to anticipate the types of interoperability required between data repositories.

EXPECTED RESULTS:

- Participation in BSN 10 right from the launch of the group
- Institutional framing text
- Vademecum to raise awareness about research data management (in collaboration with the CNRS Legal Affairs department)
- Data management plans for each institute in liaison with STI correspondents ("Corists") (framing document on the DMPs, study on how these should be adapted to each institute)
- Training plans (see PAP4) (framing document written with BSN 9)
- Involvement in international standardization committees for each discipline, awareness-raising initiatives at RDA, SE, LIBER.

LINKS WITH BSN TASK-FORCES:
- BSN 9 (training) and BSN 10 (research data)

RESOURCES:
- INIST, CNRS Legal Affairs, Huma-Num, researchers, DIST, DSI (Information Systems Department), Network of databases, document specialists in the research units, Renatis
ASSESSING CURRENT SYSTEMS FOR THE ANALYSIS OF SCIENTIFIC PRODUCTION (DATA, PUBLICATIONS, ETC.)

CONTACTS:
Ivana ROCHE and Anne-Marie BADOLATO
action33@services.cnrs.fr

OBJECTIVE:
This project has multiple objectives:

- To evaluate current tools for analyzing publications
- To promote alternative metrics alternatives ("Altmetrics", metrics developed in different scientific fields) and public value-added services ("Open Process")
- To analyze usage of the new tools provided for researchers

EXPECTED RESULTS:

- Short term:
  - Take stock of the current situation and report
  - Guide to best practices
- Medium and long-term:
  - Gathering common tools for the analysis of scientific production for decision-makers and researchers
  - Provide support for people in STI who are in charge of these analyses (methodology, tools)

LINKS WITH BSN TASK-FORCES:
None

RESOURCES:
INIST (Institute for Scientific and Technical Information), SAPPSS (Supporting Service for Scientific Prospective & Policy), Cleo, STI correspondents (Corists), ISTEX
STIMULATING STI RESEARCH AND INNOVATION

CONTACT:
Claire FRANCOIS
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OBJECTIVE:
To stimulate French participation in research and innovation projects in the different STI functions (access to STI, definition of structures and protocols, archiving, representation and visualisation of documents and data) to in turn facilitate the production of technologies to help optimize existing services and develop new services.

To attain this objective the following are required:

- the involvement of all STI stakeholders at the Pôle Lorrain (University of Lorraine, LORIA, ATILF etc.) and the INIST, the development of STI partnerships with research organizations (development of projects in networks),
- the involvement of the Mission for Interdisciplinarity (MI) for preparatory work on interdisciplinarity,
- the genericity of the STI tools and technologies provided as part of the services so that they are taken up on a transdisciplinary basis based on specific methods,
- the consolidation of existing collaboration networks in the different STI functions at national, European and international levels.

5 sections:
1. Analysis of content (data, text and opinion mining), semantic enrichment, knowledge representation (classification and mapping of information, diversification of indicators: Altmetrics, etc.)
2. Representation of structured documents (XML and DTD schemas, formats, etc.)
3. Metadata (data exposure, Semantic Web, etc.),
4. Libraries of structured data manipulation software
5. Production of ontologies and structured terminological sets

Also the idea is to implement technologies which are tried out in these fields of work and particularly as part of the ISTEX project (in the short or medium term).

EXPECTED RESULTS:

- Take stock of the current situation in France, Europe and the world as a whole (Spring 2014)
- Identification of French stakeholders (Spring 2014)
- Launch a call for projects for team to work on IsteX
- Share best practices and dissemination of reference tools
• Set up calls for projects which will develop STI research and innovation

LINKS WITH BSN TASK-FORCES:
• BSN 2, particularly as its scope is moving towards including innovative technologies which are applicable to BSN services.

RESOURCES:
• Stakeholders in the Lorraine region in STI research and their partners
DEVELOPING SCIENTIFIC TERMINOLOGIES

CONTACT:
Catherine POUAPON-CZYSZ
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OBJECTIVE:
This project aims to pave the way for the creation of value-added services for researchers.
Its objective is to build, maintain or develop structured terminological repositories and cooperate with national terminological databases for different end usages:

- Facilitate efficient access to information via semantic search functionalities by integrating terminologies,
- Enhance the visibility and indexing of research production and data through enriched annotation (or indexation) of contents,
- Facilitate the analysis of scientific content and the processing of large volumes of data for example to support scientific monitoring or steering.

LINKS WITH BSN TASK-FORCES:
BSN 3 section as part of the development of the ISTEX (semantic metadata enrichment) platform’s services and BSN 10 for indexing research data

RESOURCES:
INIST which needs to define the role to be played by other units and coordinate work on the project.
Means:

- People: 20 document specialist engineers to work on building thesauruses and skill cartridges. 7 are involved in the appropriation of tools and an annotation and indexation platform.
- Technical: acquisition of an industrial terminology management tool (ITM by Mondeca), PUMA (CNRS call for offers) planned in 2014 for the acquisition of an annotation and indexation platform.
- Documents: TermSciences portal.

EXPECTED RESULTS:
- Implement a framework for cooperation with current suppliers of terminological corpora (a convention?) and find new corpora
- Production of a development plan for scientific terminologies (evolution of Term-Sciences)
- Make available a multi-field concept reference base to set out ontologies

**LINKED ACTIONS:**
ISTEX project, Isidore, research stimulation plan, Thetra
CONTACT:
Anne CIOLEK
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OBJECTIVE:
Promote the publication (publishing, dissemination) of metadata and quality data for those who wish to reuse such elements
This concerns:
• research data and associated texts (articles, books, reports; Web 2.0 initiatives like blogs by researchers and laboratories)
• metadata from databases (bibliographic or factual bases, catalogues, images etc.)
For quality reasons, standards need to be applied to the data and metadata themselves to ensure their long-term preservation and accessibility and interoperability.

EXPECTED RESULTS:
• Coordination of a network of stakeholders involved in document engineering and the curation of metadata and data
• Exposure of data and metadata in an interoperable and reusable form according to Web of data standards
• Development, promotion and involvement of INIST personnel with strong document engineering skill sets which are scientifically complementary
• Writing and distributing guides for best practices
• Participation in standardization meetings and committees

This is a transversal project and therefore linked to many of the other PAPs

LINKS WITH BSN TASK-FORCES:
• BSN 2
• BSN 3

48 "The concept of curation refers to a set of practices and usages linked to the selection, editorialization and sharing of informational content of all kinds". AFNOR: Virtual library documents and norms (BIVI).
http://www.bivi.fonctions-documentaires.afnor.org/sites-autres/fonctions-documentaires/ofm/fonctions-documentaires/v/v-10-40/2
• BSN 4
• BSN 5
• BSN 6
• BSN 7
• BSN 10

RESOURCES:
CCSD (Centre for Direct Scientific Communication), Persée, Cleo, INIST (Institute for Scientific and Technical Information), HumaNum, ABES (Bibliographic Agency for Higher Education), etc.
PAP 4
SUPPORTING AND PROMOTING STI

- Define and promote sharing of common rules for supporting and promoting STI projects
- Develop analysis tools to evaluate STI results in the Institutes;
- Support STI innovation

**National project leader:**
Patrice BOURDELAIS
Director of the InSHS
(Institute for Humanities and Social Sciences)
CLARIFYING THE LEGAL SITUATION FOR DIGITAL STI

IMPLEMENTING AN ETHICAL CHARTER FOR STI

DEVELOPING SECURITY SERVICES FOR STI

DEVELOPING AN OVERALL APPROACH FOR CHANGES TAKING PLACE IN STI

UPDATING SKILLS AND TRAINING STI PERSONNEL

IMPLEMENTING AWARENESS-RAISING AND TRAINING INITIATIVES FOR DOCTORAL STUDENTS (DOCTORAL SCHOOLS), RESEARCHERS AND TEACHER-RESEARCHERS IN LABORATORIES

DEFINING A TRAINING PLAN FOR INIST PERSONNEL

ENSURING ACCESS TO AND ENGINEERING FOR THE SCIENCE ARCHIVE (ISTEX PROJECT)
CLARIFYING THE LEGAL SITUATION FOR DIGITAL STI

CONTACT:
Nicolas CASTOLDI
action41@services.cnrs.fr

OBJECTIVE:
The legal side of STI remains unstable. Laboratories find themselves having to choose between two equally unworkable solutions - either working without legal considerations or not doing anything.
The objective is to provide CNRS units and their partners with reference material on access to documents, document usage, publication and data.
The objective is also to make clear the legal alternatives available for Open Access publications.
Another priority objective is to cover the full range of public value-added services which is currently poorly defined in a context where the market dominates.

- Expected short-term objectives
  - Base our work on practices at the INB in the legal sphere
- Expected long-term objectives
  - Synergy, making a local action project more widespread

EXPECTED RESULTS:
- Legal Hot Line to support researchers and the Institutes
- International Call for Offers with a specifications document set up within a partnership and by consulting all the Institutes on their exact requirements
- Legal framework for value-added services existing within the norms of public digital law.

LINKS WITH BSN TASK-FORCES:
NONE

RESOURCES:
- CNRS legal department; ISTEX legal consultation (A. Bensoussan) Emi-lie.Masson@cnrs.fr
- TGIR Huma-Num, CLEO
IMPLEMENTING AN ETHICAL CHARTER FOR STI

CONTACT:
Michele LEDUC
action42@services.cnrs.fr

OBJECTIVE:
STI is constantly and rapidly evolving. Many practices involve the use of differentiated forms of research data with different statuses - sharing practices for data, results or publications evolve a great deal because business or technological models are constantly being renewed. There is therefore a particularly favourable context for the definition of ethical principles able to transcend instrumental categories and reaffirm public research objectives in the global context of Open Science.

EXPECTED RESULTS:
- Definition of the principles to be included in an Ethical Charter
- Analysis of existing Charters (INRA etc.)
- Ethical Charter for STI provided for the CNRS and its partners
  - Short and medium-term
    - March 2014: Definition of the principles;
    - June 2014: Adoption of Ethical Charter for STI
  - Synergy, making a local action project more widespread

LINKS WITH BSN TASK-FORCES:
- No direct links but ethics are part of the approaches of all the individual segments

RESOURCES:
- Daniele Bourcier, Member of the CNRS Ethics Committee and ALLISTENE (the Digital Sciences and Technologies Alliance).
DEVELOPING SECURITY SERVICES FOR STI

CONTACT:
Philippe GASNOT
action43@services.cnrs.fr

OBJECTIVE:
STI is subject to the usual threats which confront the circulation of any digital information. These threats are even more self-evident for sensitive data and results. Protecting STI installations and contents is one of the explicit priorities for which progress needs to be made in the fight against intrusion and unwanted extraction on national and international levels. It is important for the CNRS to equip itself with rules and services which respond to this requirement.

EXPECTED RESULTS:
- Definition of rules and advice, precautions to be respected for STI in compliance with the Information systems security policy (PSSI)
  - Short and medium-term. March 2014: First framing document and analysis of requirements
  - June 2014: Security Measures Plan, guidance for laboratories

LINKS WITH BSN TASK-FORCES:
NONE

RESOURCES:
- Exchanges of best practices particularly with the SOLEIL TGIR (practices from the French Brain & Spine Institute)
DEVELOPING AN OVERALL APPROACH FOR CHANGES TAKING PLACE IN STI

CONTACT:
N
action44@services.cnrs.fr

OBJECTIVE:
Many initiatives and prospects for change are appearing both nationally and internationally. The general weakness of epistemological thought contrasts with the rapid accumulation of data and results. The question of the position of research in a context which is hard to understand is fundamental - an eternal source of promise or an actual revolution? Probably both. The current situation therefore needs to be analyzed in the light of the "structure of scientific revolutions".

EXPECTED RESULTS:
- Organization of a network to study the effects of changes to STI in the digital era which combine ethical, scientific, epistemological, technical and societal data without any apparent long-lasting links and without a clear overall approach
  - Short and medium-term. Conference in Meudon in March 2014
  - Creation of a network for inter-institute study
- Synergy, making a local action project more widespread

LINKS WITH BSN TASK-FORCES:
NONE

RESOURCES:
- 

LINKED ACTIONS:
UPDATING SKILLS AND TRAINING STI PERSONNEL

CONTACT:
Joanna JANIK
action45@services.cnrs.fr

OBJECTIVE:
Networks of STI personnel like Renatis, Medici, RBDD (Databases Network) and Regional networks play a crucial role in organizing and sharing skills and training. These networks lead training projects in relation with researchers’ requirements using their essential know-how and computing skills. The objective is for these capacities and abilities to be used to respond to all CNRS units’ STI requirements through the construction of a national programme which will become operational in 2014 and last for several years.

EXPECTED RESULTS:
- Definition of the target personnel, means to be used and skill acquisition objectives through reference to the STI personnel’s identified requirements
- These personnel are in reference groups which need to be identified using an approach favouring career development and the improvement of initial and intermediate qualifications
- Definition of the objectives for a national training Plan for STI, 2014 objectives (March 2014) then objectives to be defined on the basis of these for the following years

LINKS WITH BSN TASK-FORCES:
BSN 9

RESOURCES:
- Anne SOLWEIG (Medici)
- Françoise GIRARD (Renatis)
- CNRS Human Resources, OMES (Scientific Careers Observatory)

LINKED ACTIONS:
- Research data and more generally the work of PAP 3
IMPLEMENTING AWARENESS-RAISING AND TRAINING INITIATIVES FOR DOCTORAL STUDENTS (DOCTORAL SCHOOLS), RESEARCHERS AND TEACHER-RESEARCHERS IN LABORATORIES

CONTACT:
DIST
action46@services.cnrs.fr

OBJECTIVE:
- Raise STI awareness and train doctoral students, researchers and teacher-researchers in STI using continuous and initial training (provide STI training as part of higher education courses)
- Increase the available STI e-training (e-learning) accessible on computer, tablet or mobile phones
- Develop training and pedagogical engineering.
- Structure and organize the work of national organizations which give training (Huma-Num, Cleo, INIST, CCSD, Persée, URFIST, OST etc.) to provide a national STI training programme for the scientific community

EXPECTED RESULTS:
- Take stock of the current situation – Scenarios – Means
- Make an inventory of all those involved nationally and of the current STI training provided;
- Make an inventory of existing and potential STI trainers;
- Make an inventory of the scientific community’s STI training requirements;
- Realisation
  - Construct and provide a national programme for face-to-face and distance (e-learning) training in STI for the scientific community covering the whole spectrum of the research work cycle.

LINKS WITH BSN TASK-FORCES:
- BSN 9

RESOURCES:
- DIST (Scientific and Technical Information Department), CNRS STI professional networks, Urfists (Regional Unit for Training In Scientific and Technical Information), INIST (Institute for Scientific and Technical Information), CNAM (National Conservatory of Arts and Crafts), University SCDs (Joint Documentation Services),
- CNRS Human Resources
LINKED ACTIONS:
- Inventory of requirements / stakeholders / training packages / trainers / skill sets
- All the PAPs to support projects with training and raising awareness as well as best practices.
CONTACT:
Isabelle KAUFFMANN
action47@services.cnrs.fr

OBJECTIVE:
• To adapt the skill sets and qualifications of the Institute's personnel to the national deployment plan for activities with a view to transforming the INIST (Institute for Scientific and Technical Information) in relation with the national training plan (project 4.5)

EXPECTED RESULTS:
• Personnel mobility for new activities

LINKS WITH BSN TASK-FORCES:
• BSN 9

RESOURCES:
• DIST (Scientific and Technical Information Department), INIST (Institute for Scientific and Technical Information),
• CNRS Human Resources / CNRS Regional Delegation for Centre-East France

LINKED ACTIONS:
• Inventory of requirements / stakeholders / training packages / trainers / skill sets
ENSURING ACCESS TO AND ENGINEERING FOR THE SCIENCE ARCHIVE (ISTEX PROJECT)

CONTACT:
Charlotte AUTARD
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OBJECTIVE:
To provide a national platform which integrates retrospective collections of scientific literature in all disciplines for the whole higher education and research community.

There are two parallel sections to this project:

- The acquisition under a national licence of an unequalled corpus of document resources and the aggregation of these scientific archives (journals, databases, corpora of texts etc.) in full text form.
- Providing innovative services with high added value for complementary usages which are interoperable with existing services on the French higher education and research landscape.

EXPECTED RESULTS:

- Access to documents
- Access to innovative services.

LINKS WITH BSN TASK-FORCES:
BSN 1, BSN 2

RESOURCES:
- ABES (Bibliographic Agency for Higher Education),
- COUPERIN
- University of Lorraine
- CPU (University Presidents Conference)
- INIST (Institute for Scientific and Technical Information)
- LORIA
- ATILF

LINKED ACTIONS:
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<td><a href="mailto:action17@services.cnrs.fr">action17@services.cnrs.fr</a></td>
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<tr>
<td>Laurent SCHMITT</td>
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<tr>
<td>Christine WEIL-MIKO</td>
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<td>PAP 1.4</td>
<td><a href="mailto:action14@services.cnrs.fr">action14@services.cnrs.fr</a></td>
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## PAP 1: OBTAINING INFORMATION
National project leader: Raymond BERARD,
Director of the Institute for Scientific and Technical Information, CNRS

## PAP 2: PUBLISHING
National project leader: Christoph SORGER
Director of the National Institute for Mathematical Sciences CNRS

<table>
<thead>
<tr>
<th>Name</th>
<th>Unit</th>
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<tr>
<td>Christoph SORGER</td>
<td>INSMI</td>
<td>PAP 2</td>
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<tr>
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<tr>
<td>Marin DACOS</td>
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### PAP 3: ANALYZING AND PROMOTING INFORMATION
National project leader: Bruno DAVID, Project Officer for Ecology, Environment and Biodiversity, Institute of Ecology and Environment, CNRS

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### PAP 4: SUPPORTING AND PROMOTING STI
National project leader: Patrice BOURDELAIS
Director of the Institute for Humanities and Social Sciences CNRS

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<tr>
<th>Name</th>
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<tr>
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<td>InSHS</td>
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<tr>
<td>Michele LEDUC</td>
<td>INP</td>
<td>PAP 4.2</td>
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### DIST (Scientific and Technical Information Department) Contacts

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<thead>
<tr>
<th>Name</th>
<th>Job title</th>
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<tr>
<td><strong>Obtaining information</strong></td>
<td>Rethinking the architecture and scope of STI access portals</td>
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<td>Developing analysis of choices and spending</td>
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<td>Providing support for institutions' licensing negotiations and purchasing strategies</td>
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<td>Supporting CNRS units' local licensing negotiations</td>
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<td>Accompanying and supporting changes to the primary document supply system</td>
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<td>Development and implementation of consultancy support for licensing negotiations</td>
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<td>Building a coherent national interdisciplinary programme for the preservation of French scientific heritage which includes long-term archiving</td>
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<td>Implementation of an organizational study of the rules for deposits in the HAL open archives</td>
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<td>Enhancing the visibility of publications and elements of publications by the CNRS and its partners</td>
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<td>Providing linguistic support to enhance the international visibility of publications and elements of publications by the CNRS and its partners by translating their metadata</td>
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<td>Enhancing and promoting scientific heritage: digitization, archiving and multimedia</td>
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<tr>
<td><strong>Analyzing and promoting information</strong></td>
<td>Analysis of CNRS institutes' publications and support for governance of scientific projects</td>
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<td>Defining and implementing an organizational policy regarding research data</td>
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